FINISHER - D1

SERVICE MANUAL

REVISION 0

Canon

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INTRODUCTION

This Service Manual contains basic data and figures on the Finisher-D1 needed to service the machine in the field.

CHAPTER 1 General Description introduces the finisher's features and specifications, and shows how to operate the finisher.

CHAPTER 2 Basic Operation provides outlines of the finisher's various mechanical workings, and explains the principles used for the finisher's various control mechanisms in view of the functions of electrical and mechanical units and in relation to their timing of operation.

CHAPTER 3 Mechanical System shows how the finisher's various mechanical workings are constructed, and how the finisher may be disassembled/assembled and adjusted.

CHAPTER 4 Maintenance and Servicing provides tables of periodically replaced parts and consumables/durables and scheduled servicing charts.

CHAPTER 5 Troubleshooting provides tables of maintenance/inspection, standards/adjustments, and problem identification (image fault/malfunction).

APPENDIX contains a general timing chart and general circuit diagrams.

The descriptions in this Service Manual are subject to change without notice for product improvement or other purposes, and major changes will be communicated in the form of Service Information bulletins.

All service persons are expected to have a good understanding of the contents of this Service Manual and all relevant Service Information bulletins and be able to identify and isolate faults in the machine.

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CONTENTS

CHAPTER 1 GENERAL DESCRIPTION

I. FEATURES 1-1
II. SPECIFICATIONS 1-2
A. Specifications 1-2
B. Cross Section 1-4
III. OPERATING THE FINISHER 1-5
A. Removing Jams from The Finisher 1-5
B. Removing Jams in Sort, Group, or Staple Sort Mode 1-7
C. Replacing the Staple Cartridge 1-10
D. Removing Staple Jams in the Stapler Unit 1-13
IV. MAINTENANCE BY THE USER 1-15

CHAPTER 2 OPERATIONS

I. BASIC OPERATIONS 2-1
A. Specifications 2-1
B. Outline of Electrial Circuitry ... 2-2
C. Inputs to and Outputs from the Finisher Controller PCB 2-3
II. FEEDING/DRIVE SYSTEM 2-14
A. Outline 2-14
B. Feeding/Delivery 2-19
C. Job Offset 2-22
D. Releasing the Knurled Belt 2-29
E. Buffer Path 2-34
III. CONTROLLING THE PADDLE 2-39
IV. CONTROLLING THE TRAY AUXILIARY PLATE 2-40
V. STAPLING 2-42
VI. TRAY MOVEMENT 2-50
VII. FANS 2-54
VIII. POWER SUPPLY 2-56
IX. DETECTING JAMS 2-59

CHAPTER 3 MECHANICAL SYSTEM

I. EXTERNALS AND CONTROLS 3-1
II. PROCESSING TRAY UNIT 3-13
III. TRAY B UNIT 3-21
IV. KNURLED BELT RELEASING UNIT 3-28
V. KNURLED BELT 3-30
VI. BUFFER ROLLER UNIT 3-31
VII. STAPLER UNIT 3-35
VIII. PCBs 3-42

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CHAPTER 4 MAINTENANCE AND SERVICING

I. PERIODICALLY REPLACED PARTS 4-1
II. CONSUMABLES AND DURABLES 4-1
III. SCHEDULED MAINTENANCE . 4-1

CHAPTER 5 TROUBLESHOOTING

I. ADJUSTMENT 5-1
A. Electrical System 5-1
II. ARRANGEMENT OF ELECTRICAL PARTS 5-14
A. Sensors 5-14
B. Microswitches 5-16
C. Motors 5-18
D. Solenoids 5-20
E. PCBs 5-22
F. Fans 5-24
G. Light-Emitting Diodes and Check Pins by PCB 5-25
III. TROUBLESHOOTING 5-30
IV. SELF DIAGNOSIS 5-38
A. Self Diagnosis 5-38
B. Alarms 5-40

APPENDIX

A. GENERAL TIMING CHART A-1
B. LIST OF SIGNALS / ABBREVIATIONS A-3
C. GENERAL CIRCUIT DIAGRAM A-5
D. SOLVENTS AND OILS LIST A-7

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CHAPTER 1

GENERAL DESCRIPTION

I. FEATURES 1-1
II. SPECIFICATIONS 1-2
A. Specifications 1-2
B. Cross Section 1-4
III. OPERATING THE FINISHER 1-5
A. Removing Jams from the Finisher 1-5
B. Removing Jams in Sort, Group, or Staple Sort Mode 1-7
C. Replacing The Staple Cartridge 1-10
D. Removing Staple Jams in the Stapler Unit 1-13
IV. MAINTENANCE BY THE USER 1-15

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I . FEATURES

1. Two Types of Stacking Trays

• The delivery tray (tray B) is designed for stapling and job offset delivery, while the interrupt tray (tray A) is designed for ordinary delivery.

2. Large Capacity

• Tray B is capable of holding 2000 sheets, while tray A is capable of holding 250 sheets, a total of 2250 sheets.

3. Wide-Ranging Paper Types

• The sheets may be of 64 to 200 g/m^2 paper.

4. Stack Job Offset Function

• The stack job offset function is offered for sorting non-staple stacks.

5. Three Types of Auto Stapling

• As many as three different types (position) are offered (front slant, rear slant, 2-point).

6. High Productivity by a Buffer Roller

• The use of a buffer roller has enabled continuous feeding of sheets from the copier while stapling or offset operation is taking place.

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II . SPECIFICATIONS

A. Specifications

1. Type

Item		Specifications		Remarks
Fixed type		Tray A	Fixed	
		Tray B	Mobile type	
Stacking		Tray A	Same as the copier's delivery method.	
		Tray B	Face-down	
Stack size		Tray A	Postcard to A3/LDR	Postcards are for R feeding only.
		Tray B	A5/STMT to A3 /LDR	A5/STMT is for R feeding only.
Paper weight		64 to 200g/m^2		
Modes		Staple stacking, non-staple stacking		
Stack thickness	Non-staple sort	Tray A	250 sheets (small-/large-size)	Paper of 80 g/m^2.
		Tray B	2,000 sheets (small-size) 1,000 sheets (large-size)	
	Staple sort	Tray A	Not possible	
		Tray B	2,000-sheet equivalent or 100 sets (small-size) 1,000-sheet equivalent or 100 sets (large-size)	
Staple/non-staple mix		Possible with conditions		
Stacking		Tray A	No offset	
		Tray B	Front/rear stack offset Staple: 20 mm offset Non-staple: 30 mm offset (offset on the internal processing tray)	
Paper detection		Non-sort tray	No	
		Sort tray	Yes	
Control panel		No		
Display		No		
Installation		Latching with mount (height adjusted by caster)		
Dimensions		665mm (W) ×708mm (D) ×995mm (H)		
Weight		65kg		
Power supply		100 to 120V/50; 60Hz, 230V/50Hz		
Maximum power consumption		350W or less		

Note 1: The term "small-size" refers to A4, A5, B5, postcard, LTR, and STMT, while the term "large-size" refers to A3, B4, LDR, and LGL.

Table 1-201

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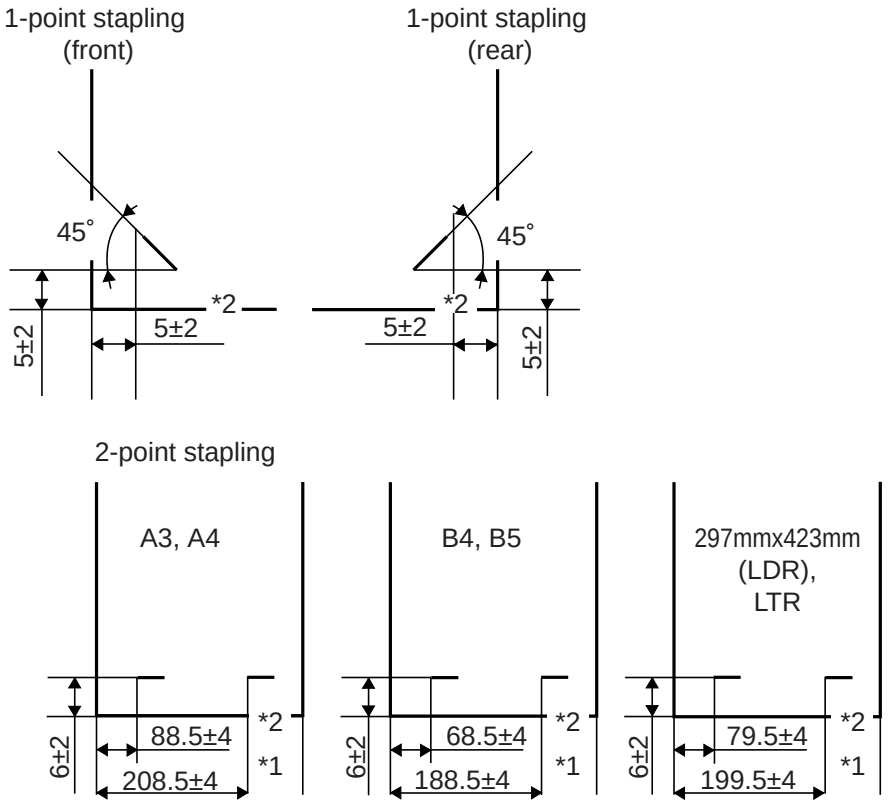
Item		Specifications		Remarks
Stapling		Punching by a rotating cam. (face-down stapling)		
Stapling position		See Figure 1-201.		
Stapling thickness		48 sheets (80 g/m^2) + 2 sheets (200 g/m^2), or thick paper of 5.7 mm or less		
Staple compartment		Special cartridge (5,000 staples)		
Staples		Special staples		
Staple detection		Yes		
Stapling size	1-point stapling	Front/rear	A3, A4, B4, B5, LDR, LGL, LTR	
	2-point stapling	A3,A4, B4, B5, LDR, LTR		
Manual stapling		None		

Table 1-202



Unit: mm

*1 The stapling interval may be adjusted in user mode.

*2 The stapling position may be adjusted using a DIP switch.

The specifications are subject to change for product improvement.

Figure 1-201

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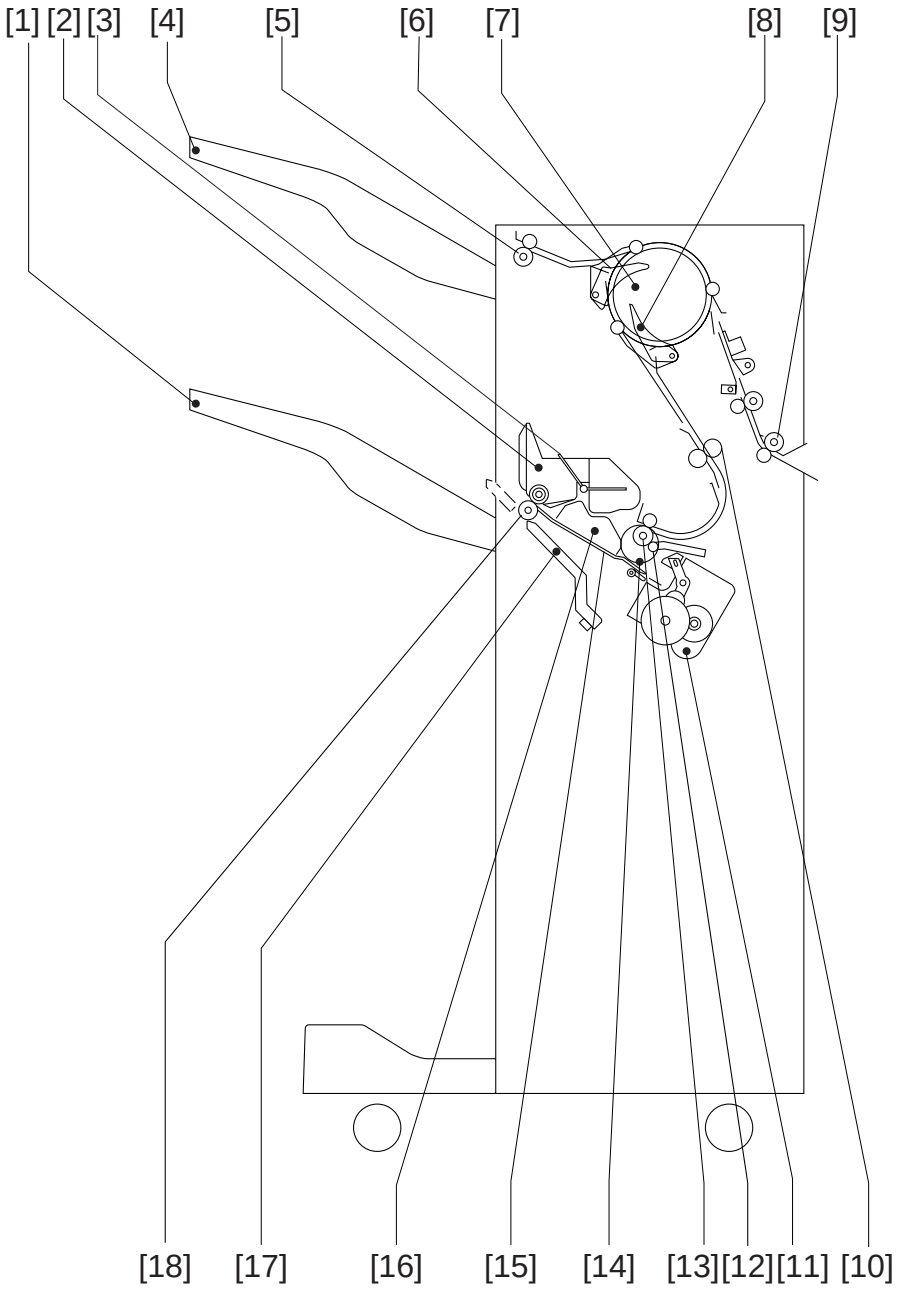
B. Cross Section



[1] Tray B
[2] Swing guide
[3] Paddle
[4] Tray A
[5] Non-sort delivery roller
[6] Upper path switching flapper
[7] Buffer roller
[8] Buffer switching flapper
[9] Inlet roller
[10] Pre-delivery roller
[11] Stapler
[12] Mobile roll
[13] Sort delivery roller
[14] Knurled belt
[15] Processing tray
[16] Jogging plate (front, rear)
[17] Tray auxiliary plate
[18] Stack delivery roller

Figure 1-202

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III . OPERATING THE FINISHER

A. Removing Jams from the Finisher

If the Jam indicator turns on, perform the following:

1) Remove the paper visible from the outside.

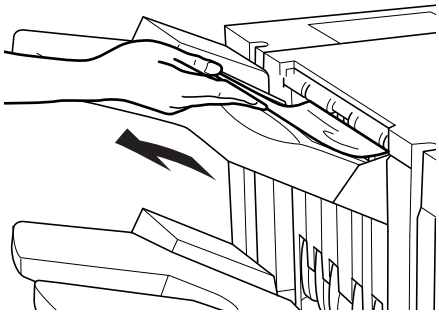

Figure 1-301

2) Open the front cover.

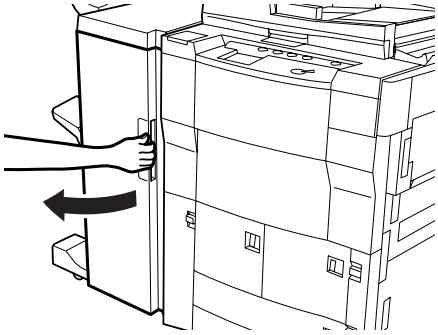

Figure 1-302

3) Open the upper cover, and check the inside of the finisher.

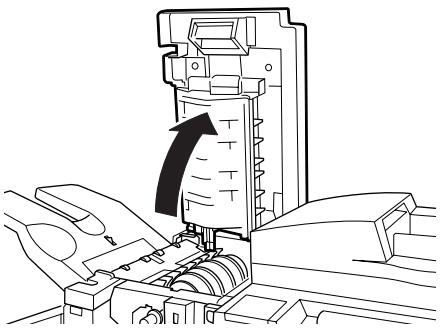

Figure 1-303

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4) Turn the green knob, and remove the jam.

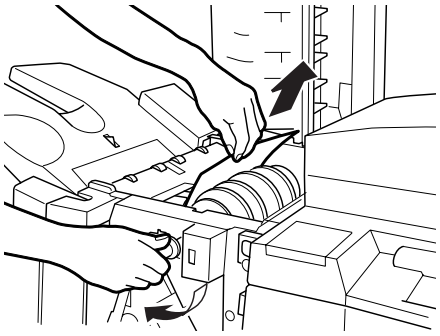

Figure 1-304

5) Push the green lever, and remove the jam.

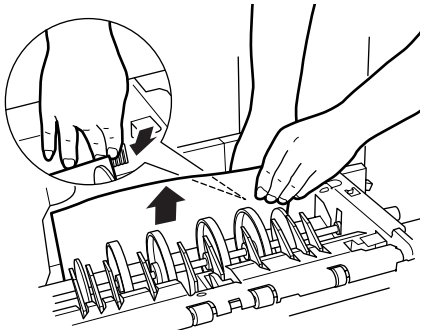

Figure 1-305

6) Close the upper cover.

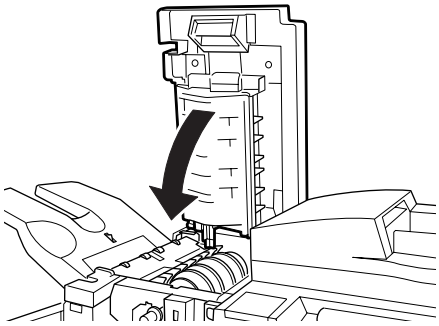

Figure 1-306

7) Close the front cover.

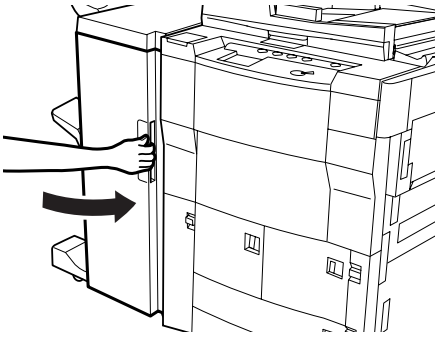

Figure 1-307

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B. Removing Jams in Sort, Group, or Staple Sort Mode

If a jam occurs in sort, group, or staple sort mode, perform the following:

1) Open the front cover.

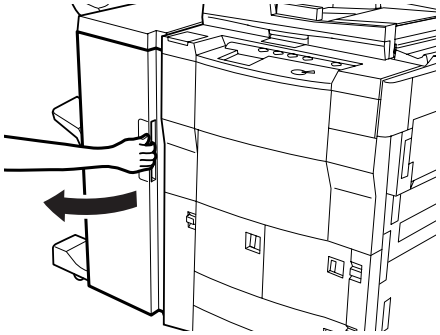

Figure 1-308

2) Open the upper cover, and check the inside of the finisher.

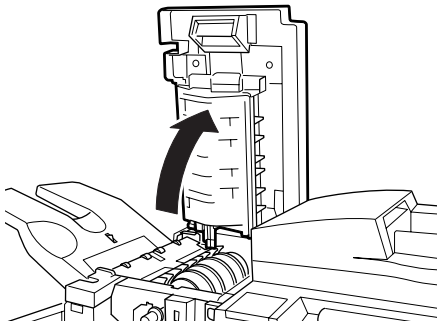

Figure 1-309

3) Turn the green knob, and remove the jam.

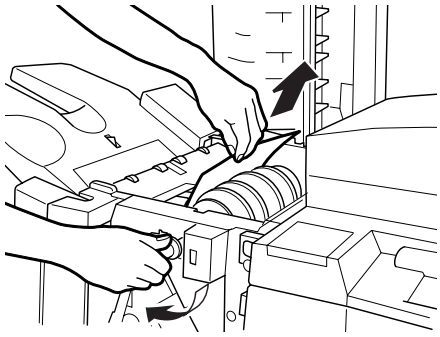

Figure 1-310

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4) Push the green lever, and remove the jam.

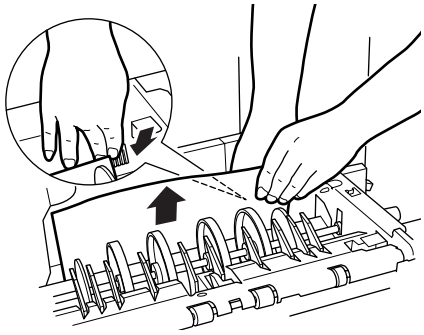

Figure 1-311

5) Close the upper cover.

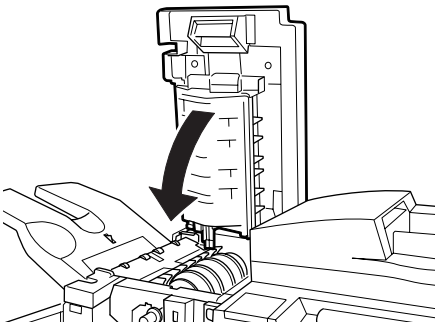

Figure 1-312

6) Open the guide, and remove the jam.

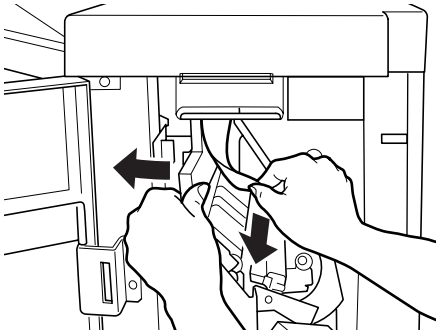

Figure 1-313

7) Shift up the lever, and remove the jam.

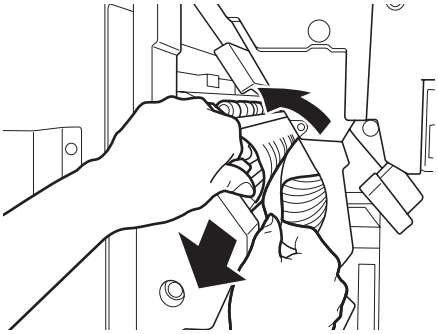

Figure 1-314

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8) Shift the lever back to its initial position.

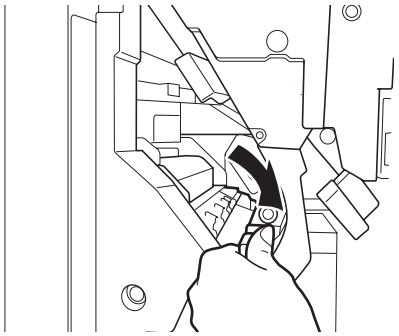

Figure 1-315

9) Open the guide, and remove the jam.

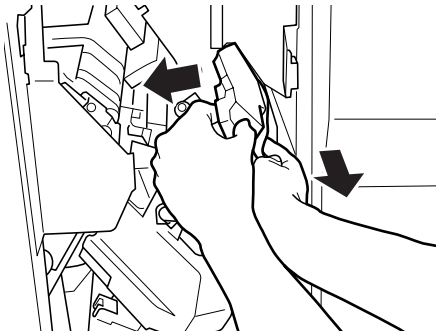

Figure 1-316

10) Open the open/close guide, and remove the jam from inside the finisher.

Caution:
Do not remove the stack being handled.

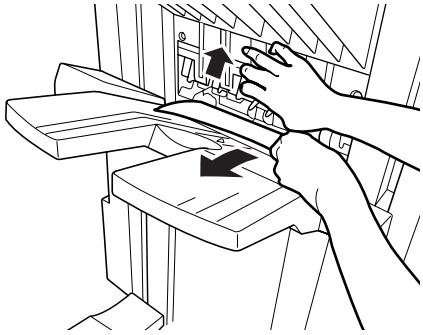

Figure 1-317

11) Close the front cover.

Reference:
The Jam message may remain on the display. If so, check for a jam once again according to the instructions.

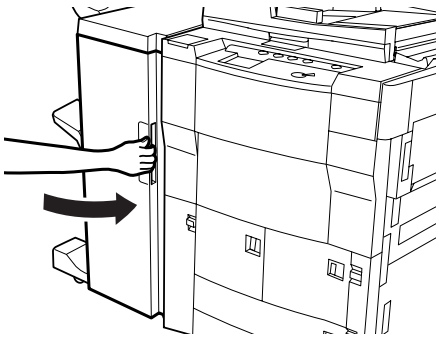

Figure 1-318

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C. Replacing the Staple Cartridge

If a staple jam occurs while the stapler is being used, perform the following:

1) Open the front cover.

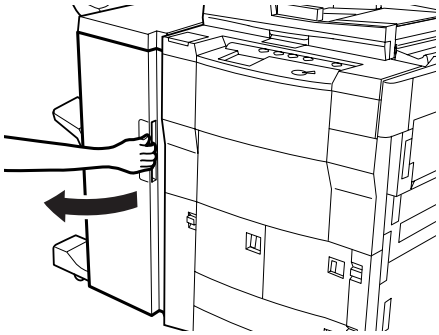

Figure 1-319

2) Shift down the green lever.

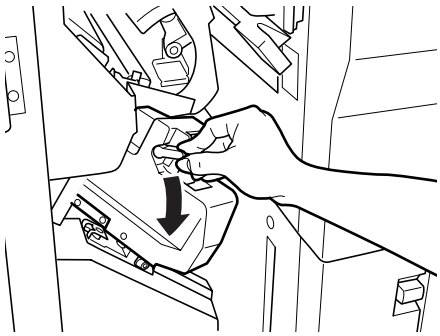

Figure 1-320

3) When the staple cartridge has slid out on its own, pick it on its left and right and slide it out.

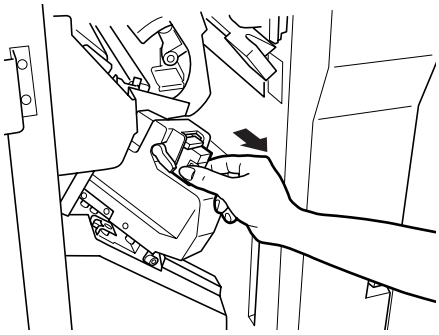

Figure 1-321

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4) Pick the empty staple case on its left and right, and slip it off.

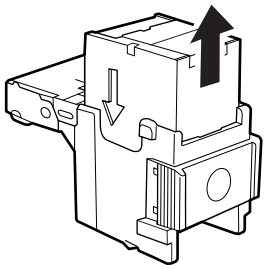

Figure 1-322

5) Set the new staple case.

Reference:

Be sure to set no more than one staple case. Further, be sure that the staple case is one designed for the finisher.

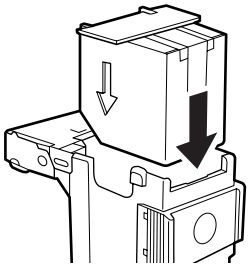

Figure 1-323

6) Remove the seal used to keep the staples together by pulling it straight off.

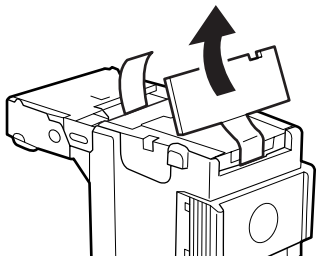

Figure 1-324

7) Push in the stapler unit until the green lever returns to its previous position.

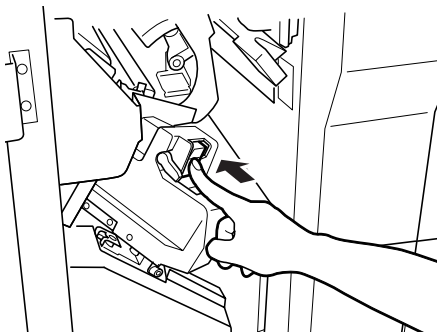

Figure 1-325

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8) Check to make sure that the stapler unit has been secured in place, and close the front cover.

Reference:

When the cover is closed, the stapler unit performs idle stapling several times automatically to edge out the staples.

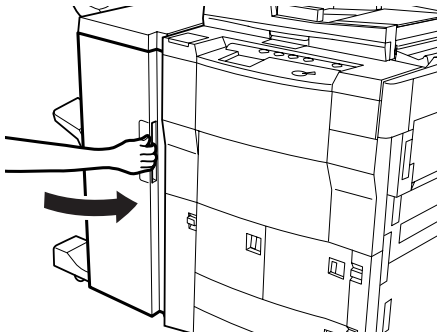

Figure 1-326

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D. Removing Staple Jams in the Stapler Unit

If the Staple Jam message is indicated, perform the following:

1) Remove the stack of sheets waiting to be stapled.

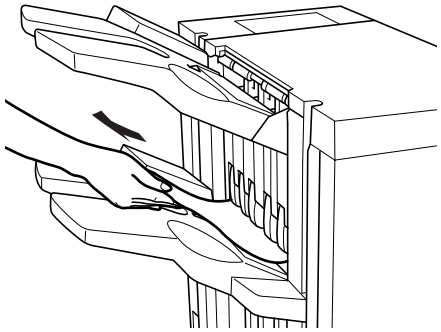

Figure 1-327

2) Open the front cover.

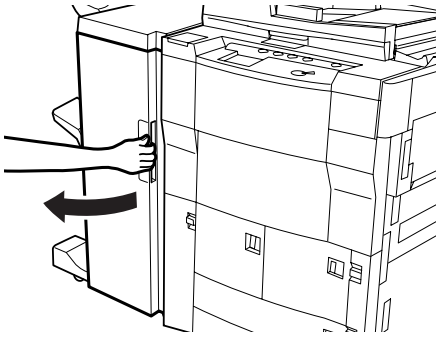

Figure 1-328

3) Shift down the green lever.

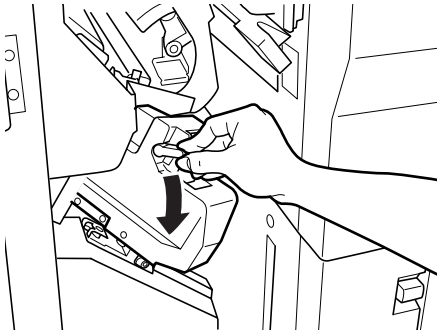

Figure 1-329

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4) When the staple cartridge has slid out on its own, pick it on its left and right and slide it out.

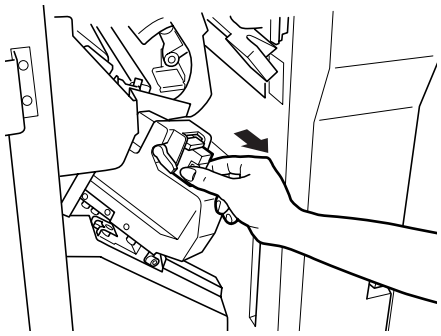

Figure 1-330

5) Shift down the tab of the staple cartridge.

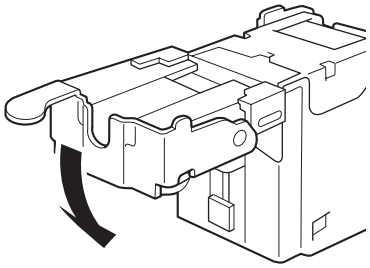

Figure 1-331

6) Remove all staples which slid out of the staple case.
7) Put the staple cartridge tab back to its pervious position.

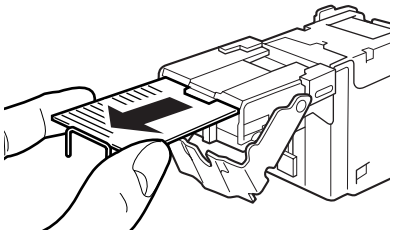

Figure 1-332

8) Put the staple cartridge back to its initial position, and close the front cover.

Reference:

When the cover is closed, the stapler unit performs idle stapling several times automatically to edge out the staples.

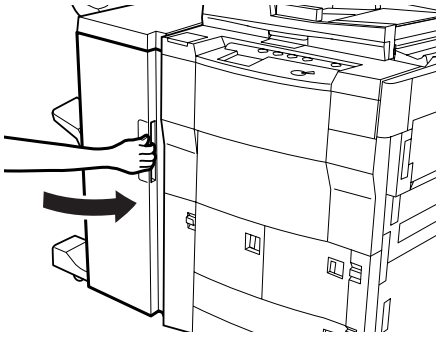

Figure 1-333

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IV . MAINTENANCE BY THE USER

As of January 1999

No.	Item	Timing
1	Staple cartridge replacement	When the message turns on (on the copier's control panel).

Table 1-401

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CHAPTER 2

OPERATIONS

1. In outline diagrams, ▮▮▮ represents mechanical drive paths, and ——→ indicates electrical signal paths.

2. Signals in digital circuits are identified as '1' for High and '0' for Low. The voltage of signals, however, depends on the circuit.

Nearly all operations of the machine are contorolled by microprocessors; the internal workings of these processors are not relevant to the service person's work and, therefore, are left out of the discussions. By the same token, no repairs are prescribed for the PCBs at the user's premises; for this reason, PCBs are discussed by means of block diagrams rather than circuit diagarams.

For the purpose of explanation, discussions are divided into the following: from sensors to finisher controller PCB input ports; from finisher controller output ports to loads; and minor control circuits and functions.

I. BASIC OPERATIONS 2-1
A. Specifications 2-1
B. Outline of Electrial Circuitry ... 2-2
C. Inputs to and Outputs from the Finisher Controller PCB 2-3
II. FEEDING/DRIVE SYSTEM 2-14
A. Outline 2-14
B. Feeding/Delivery 2-19
C. Job Offset 2-22
D. Releasing the Knurled Belt 2-29
E. Buffer Path 2-34
III. CONTROLLING THE PADDLE 2-39
IV. CONTROLLING THE TRAY AUXILIARY PLATE 2-40
V. STAPLING 2-42
VI. TRAY MOVEMENT 2-50
VII. FANS 2-54
VIII. POWER SUPPLY 2-56
IX. DETECTING JAMS 2-59

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I . BASIC OPERATIONS

A. Specifications

The finisher is designed to receive sheets from its host copier and deliver them after performing specific jobs on them: i.e., non-sort stacking, job offset (Note), and stapling.

The series of operations are controlled by the finisher controller PCB, and some of them are driven in response to various commands from the copier.

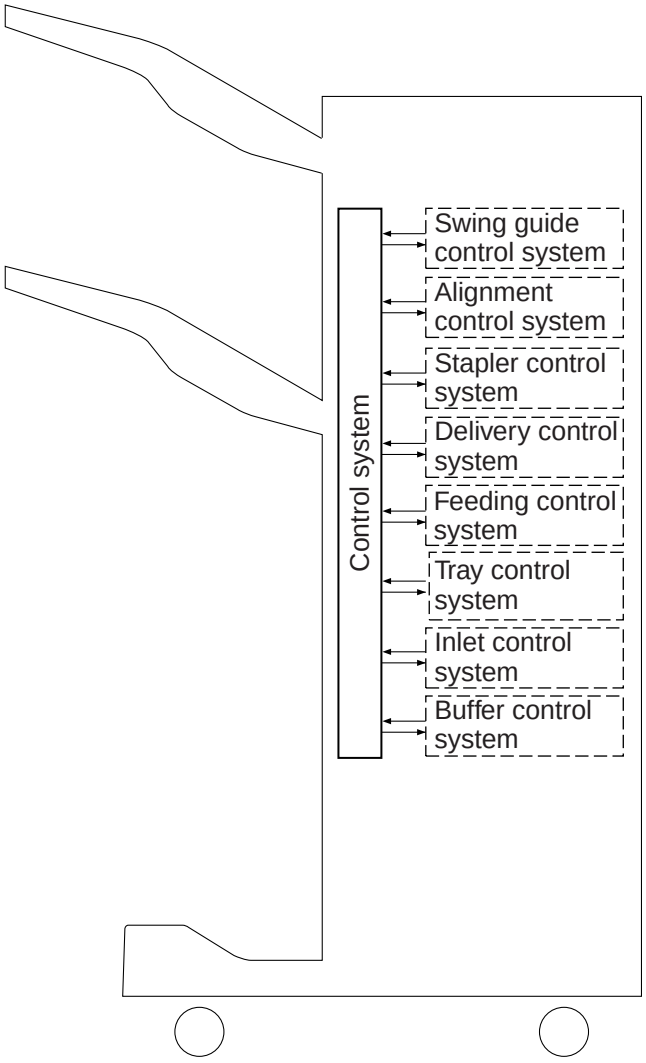

Figure 2-101

Caution:
The term "job offset" refers to shifting each arriving stack toward the front or rear slightly away from the previous stack, thereby sorting the sets.

B. Outline of Electrical Circuitry

The series of operations of the finisher are controlled by the finisher controller PCB, which is an 8-bit microprocessor (CPU). The finisher controller PCB serves to control sequences of operations and to communicate in serial with the host copier.

The finisher controller PCB drives the solenoids and motors in response to various commands from the host copier through a serial communication line. It also communicates data on various sensors and switches to the host copier using the serial communication line.

The functions of the major ICs mounted on the finisher controller PCB are as follows:

- IC101 (master CPU)
  Controls sequences of operations.
- IC102 (master EEPROM)
  Backs up adjustment values.
- IC105 (master EPROM)
  Contains sequence programs.
- IC106 (master RAM)
  Backs up initial data.
- IC108 (communications IC)
  Communicates with the host copier.
- IC121 (slave CPU)
  Controls sequences of operations.
- IC122 (slave RAM)
  Backs up initial data.
- IC123 (DRAM)
  Controls communication between master CPU and slave CPU.

Figure 2-102 shows the flow of signals between the finisher and the option controller.

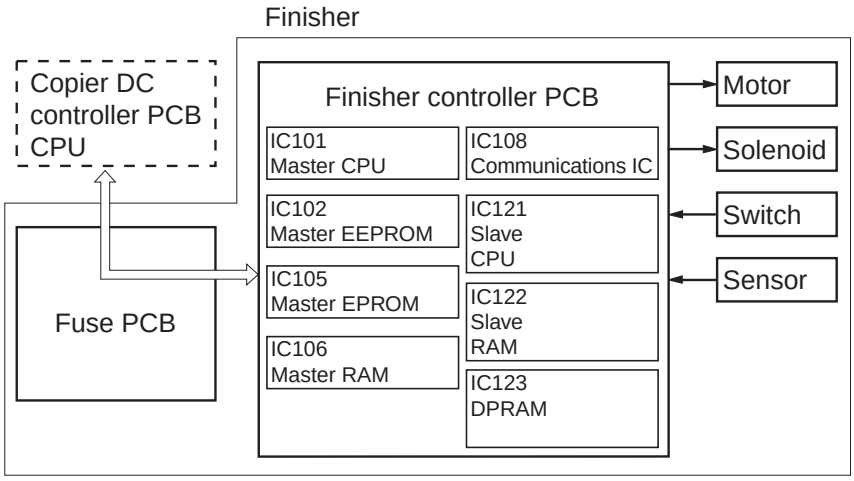

Figure 2-102

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C. Inputs to and Outputs from the Finisher Controller PCB

1. Inputs to the Finisher Controller PCB

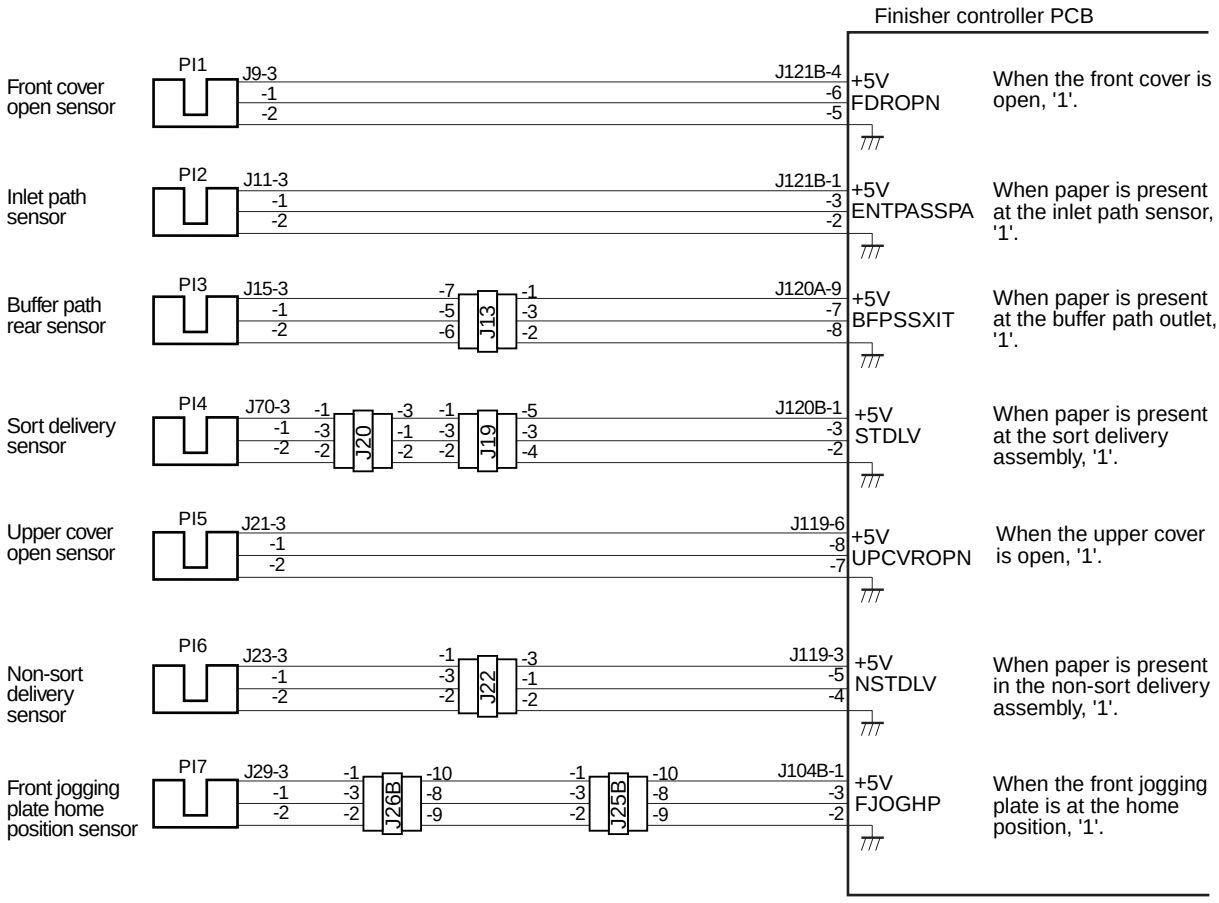

Figure 2-103

2. Inputs to the Finisher Controller PCB

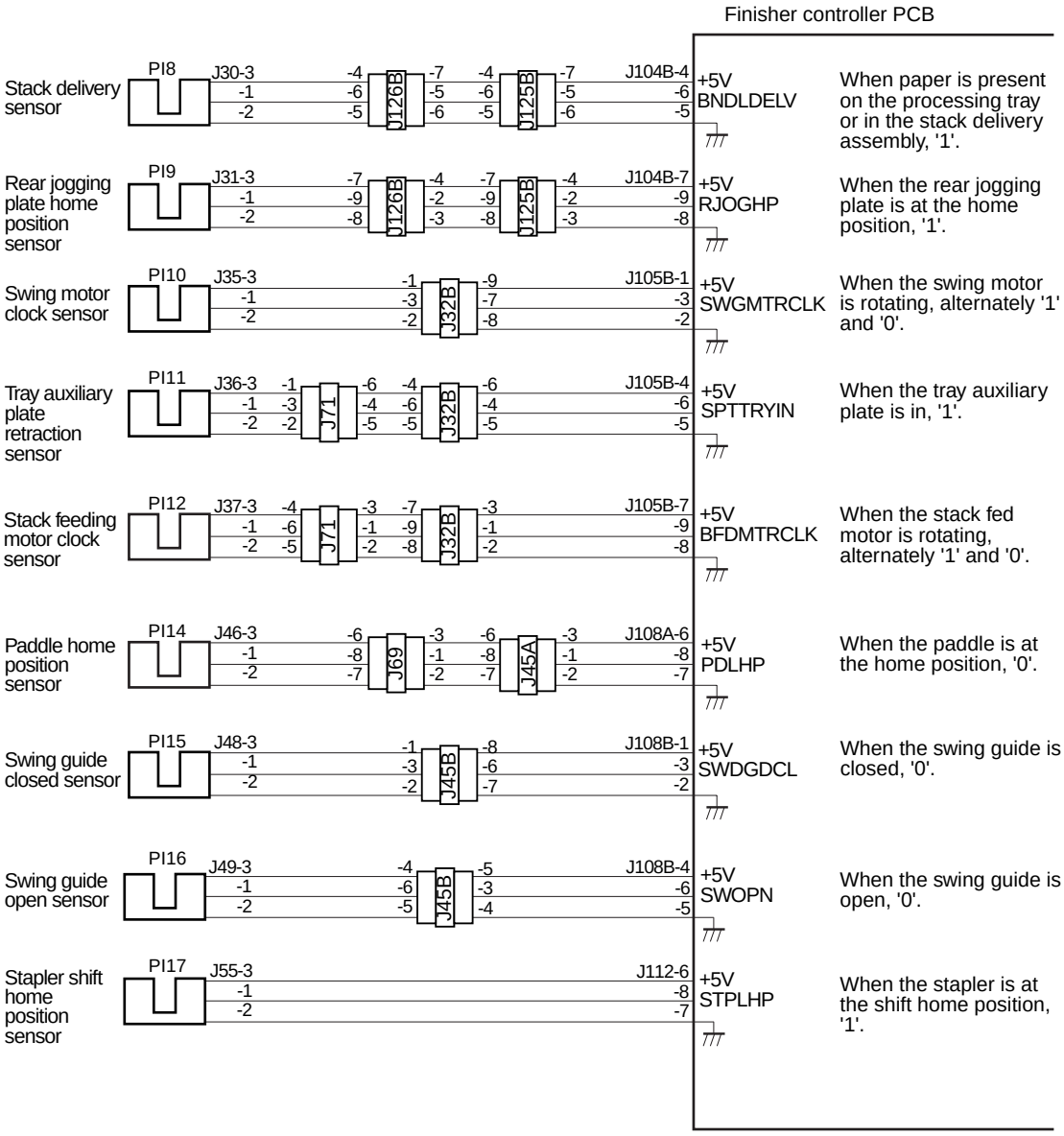

Figure 2-104

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3. Inputs to the Finisher Controller PCB

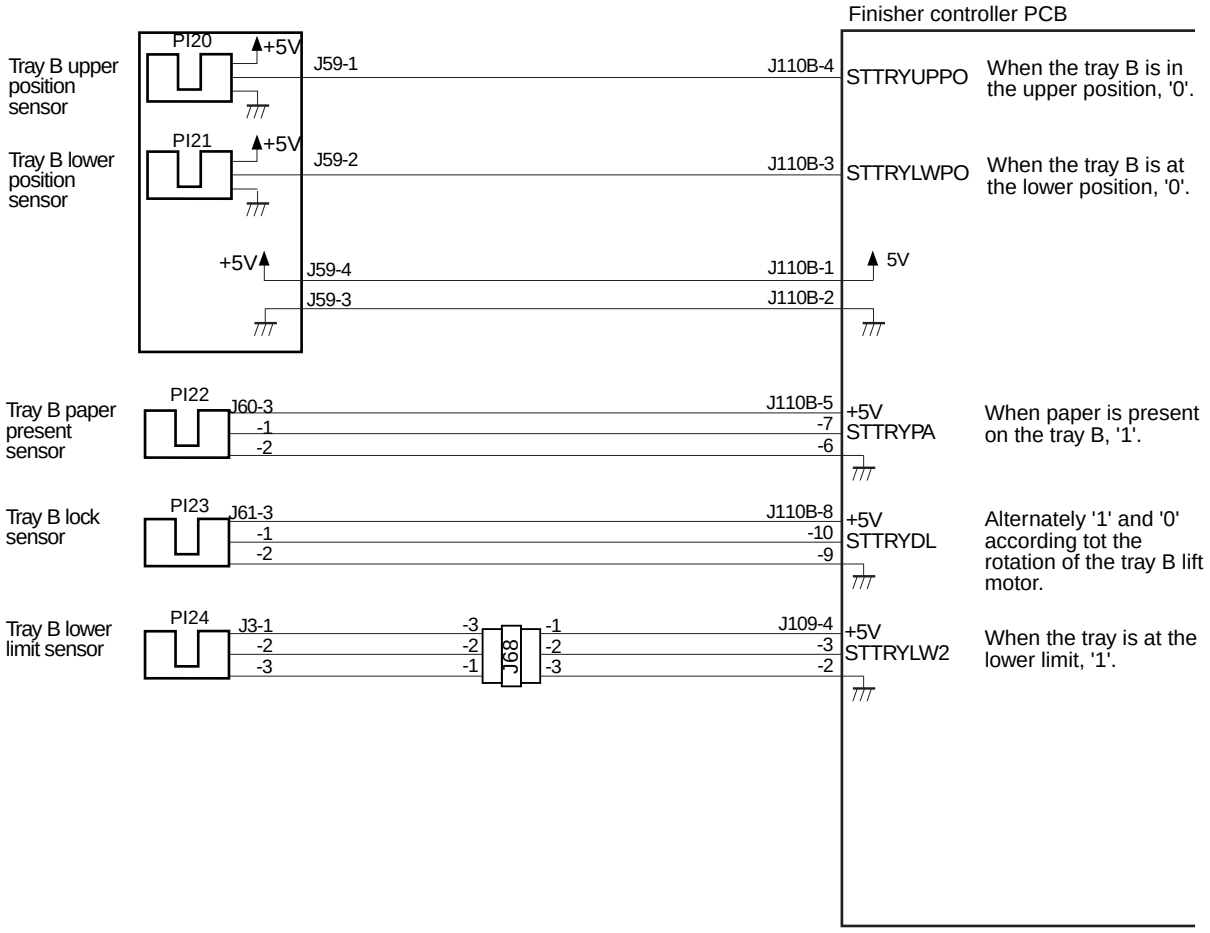

Figure 2-105

4. Outputs from the Finisher Controller PCB

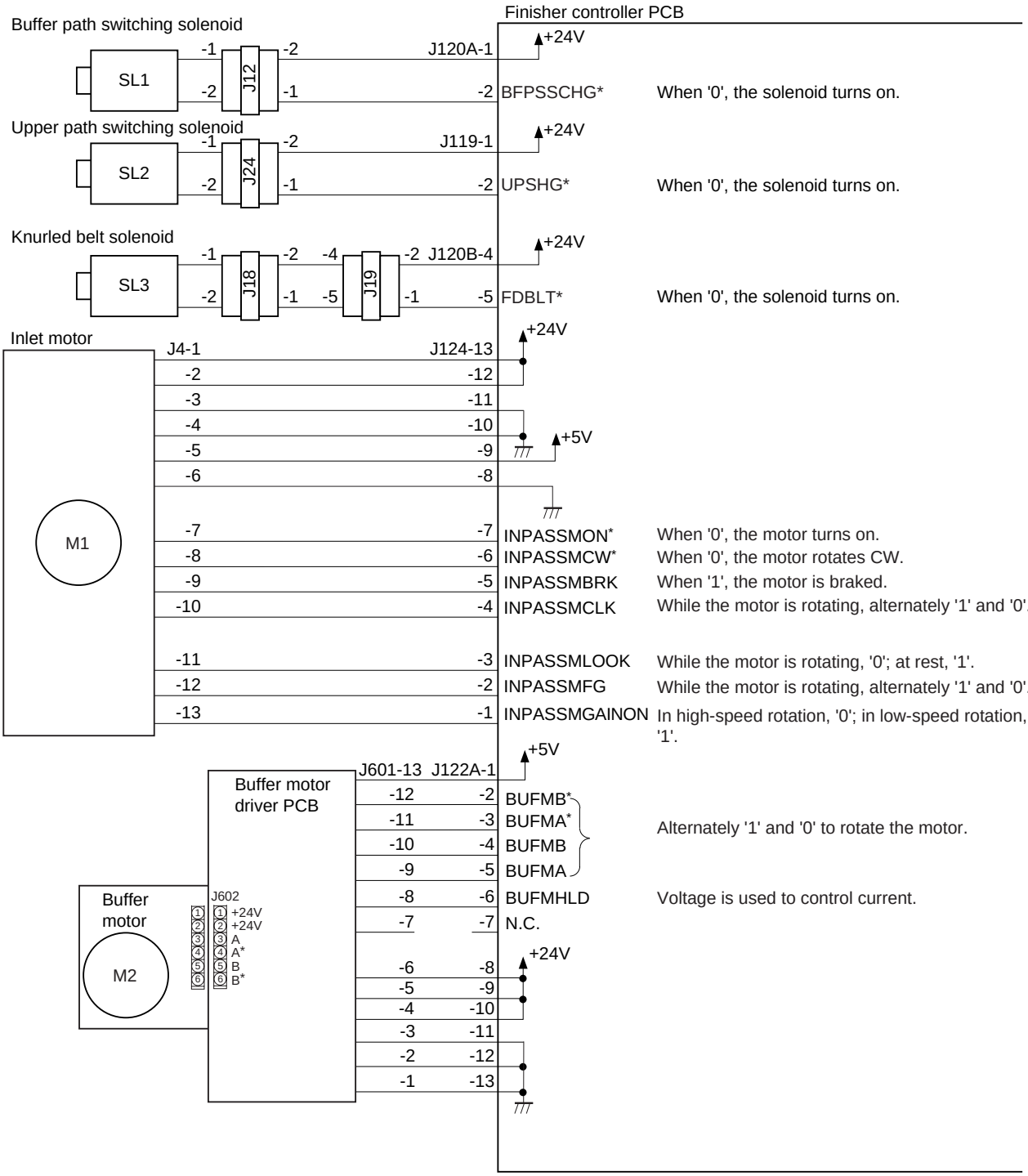

Figure 2-106

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5. Outputs from the Finisher Controller PCB

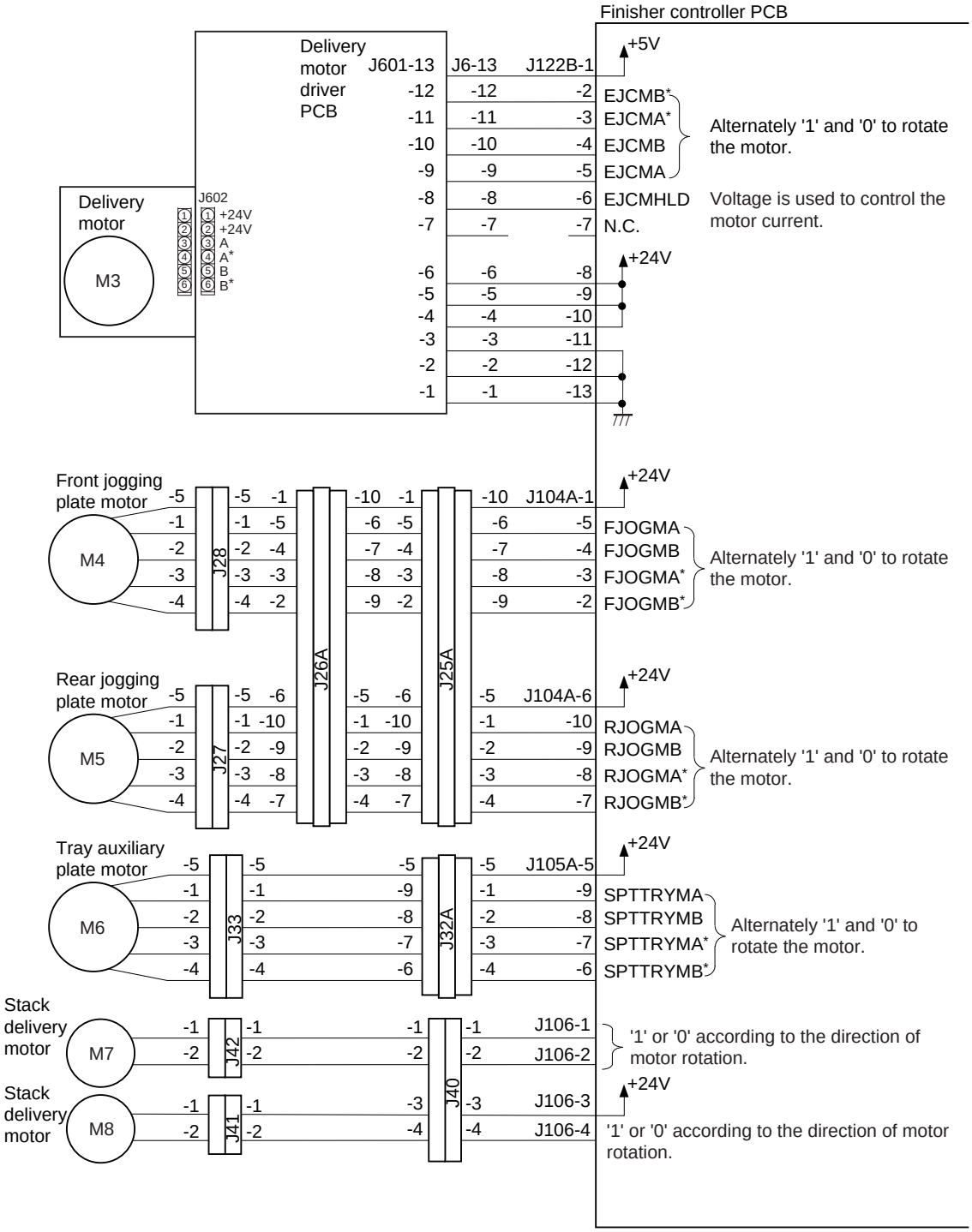

Figure 2-107

6. Outputs from the Finisher Controller PCB

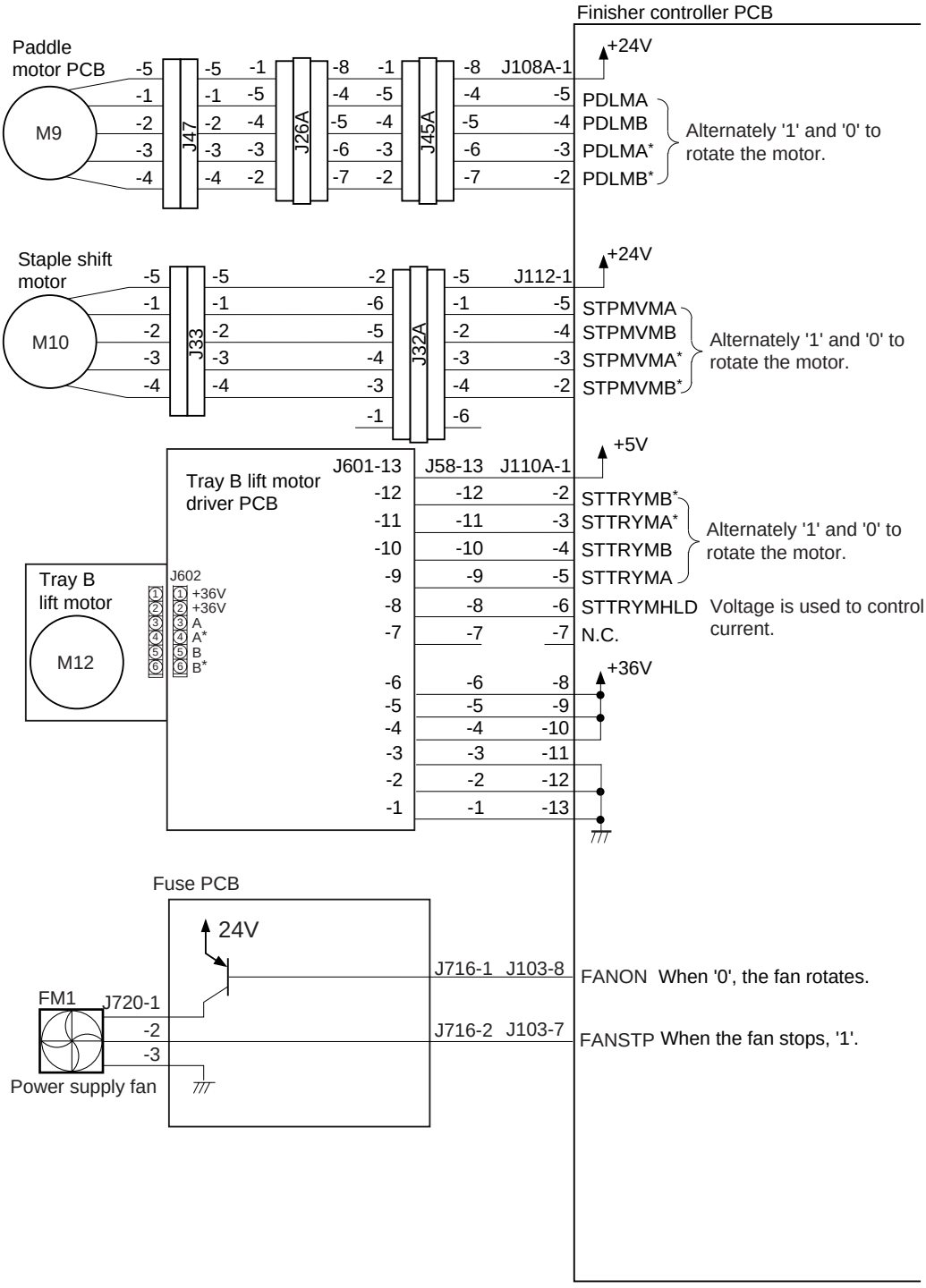

Figure 2-108

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7. Inputs to and Outputs from the Finisher Controller PCB

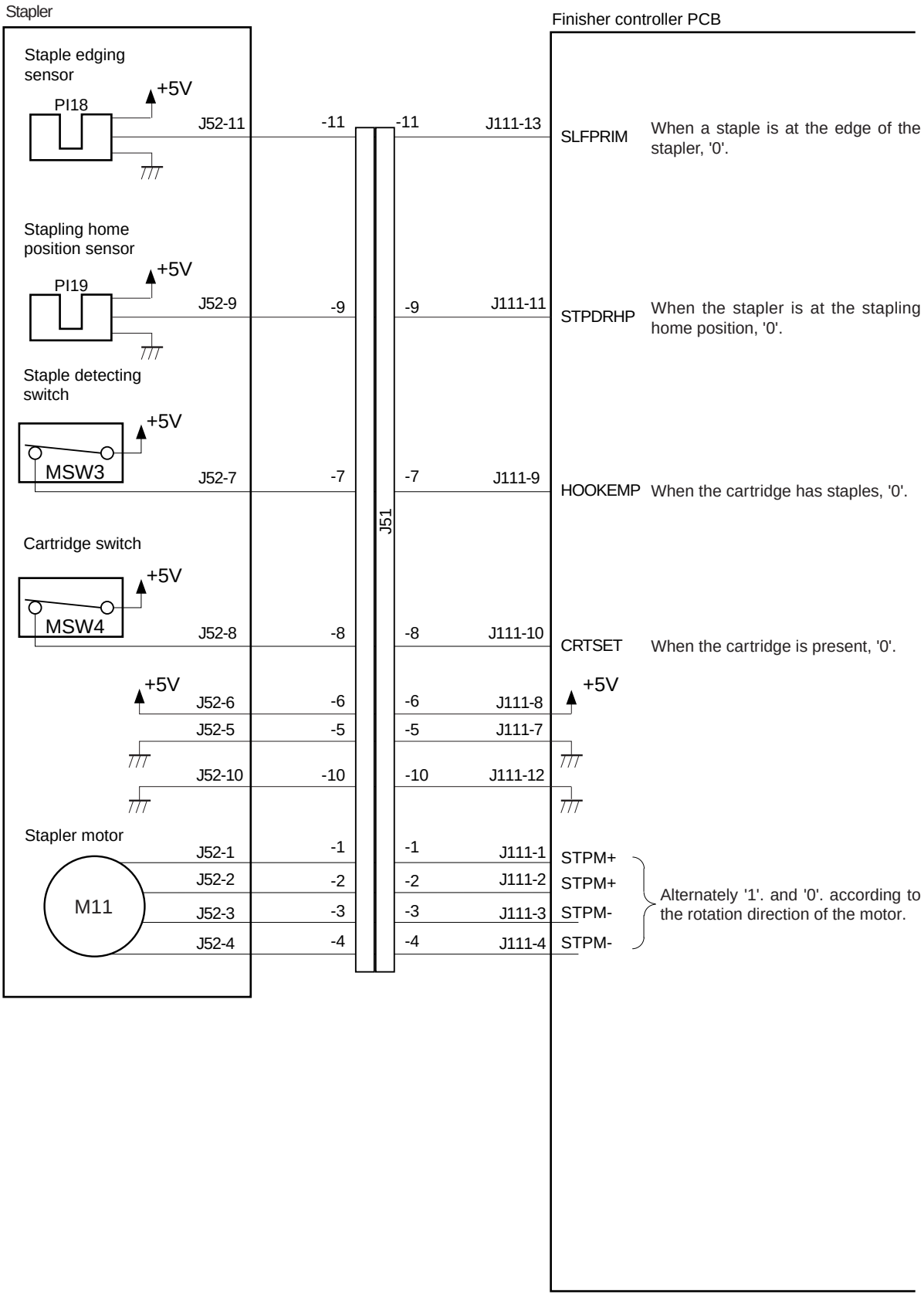

Figure 2-109

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8. Inputs to and Outputs of the Finisher Controller PCB

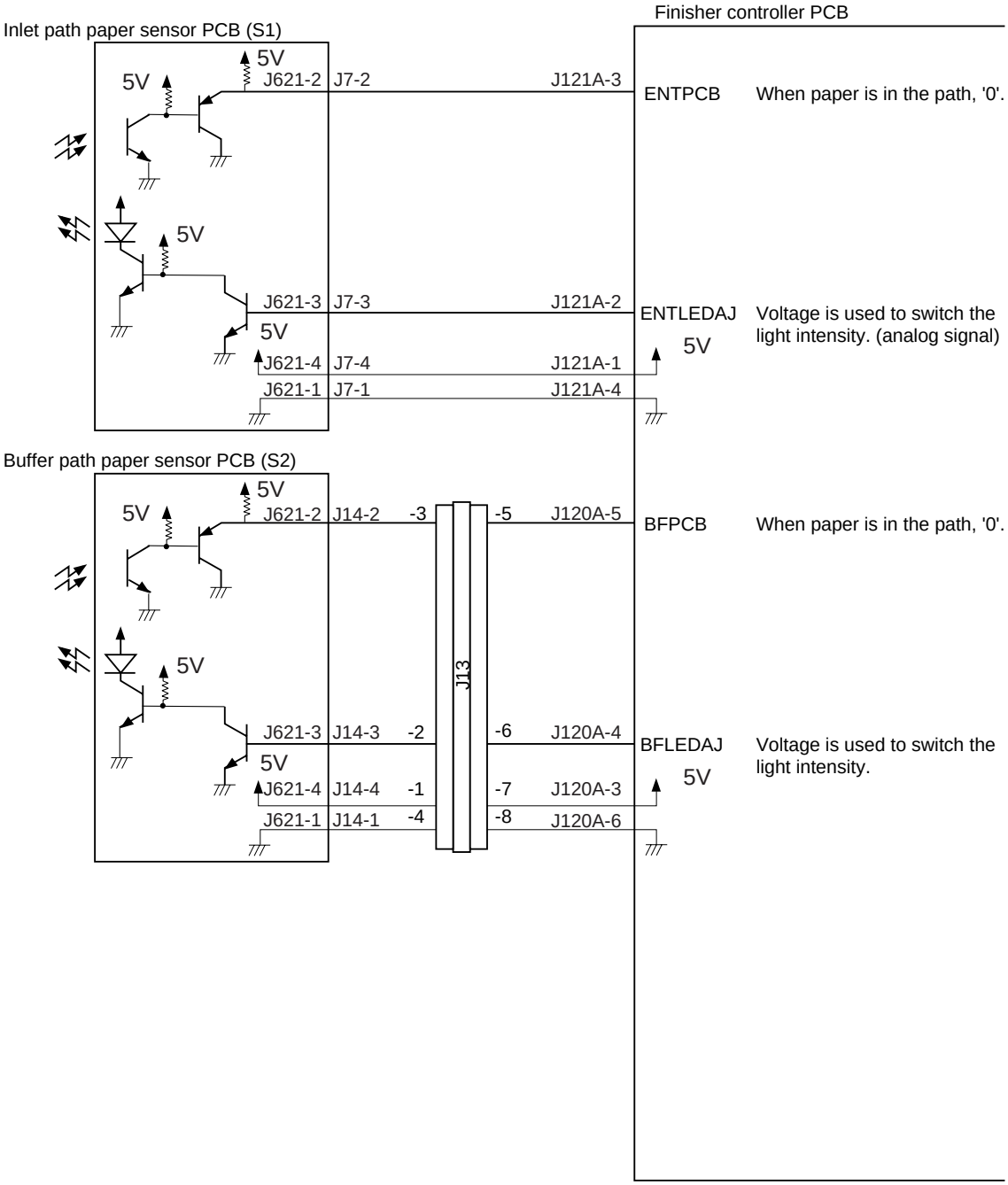

Figure 2-110

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9. Inputs to and Outputs from the Finisher Controller PCB

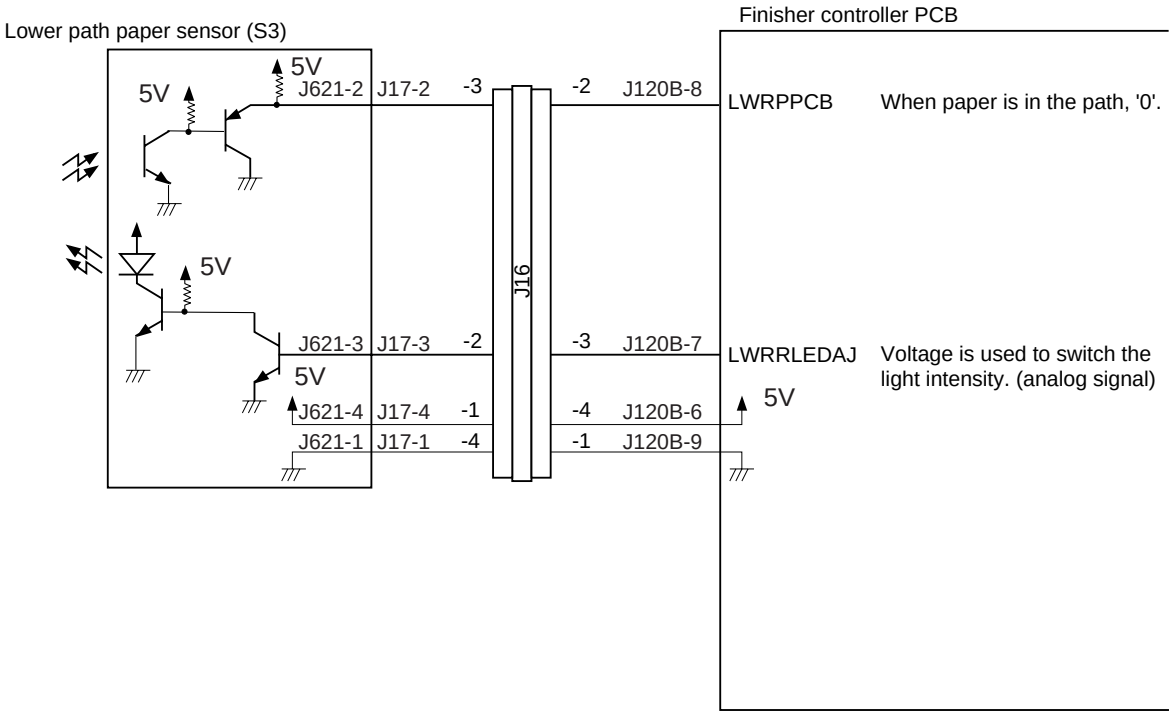

Figure 2-111

10. Inputs to and Outputs from the Finisher Controller PCB

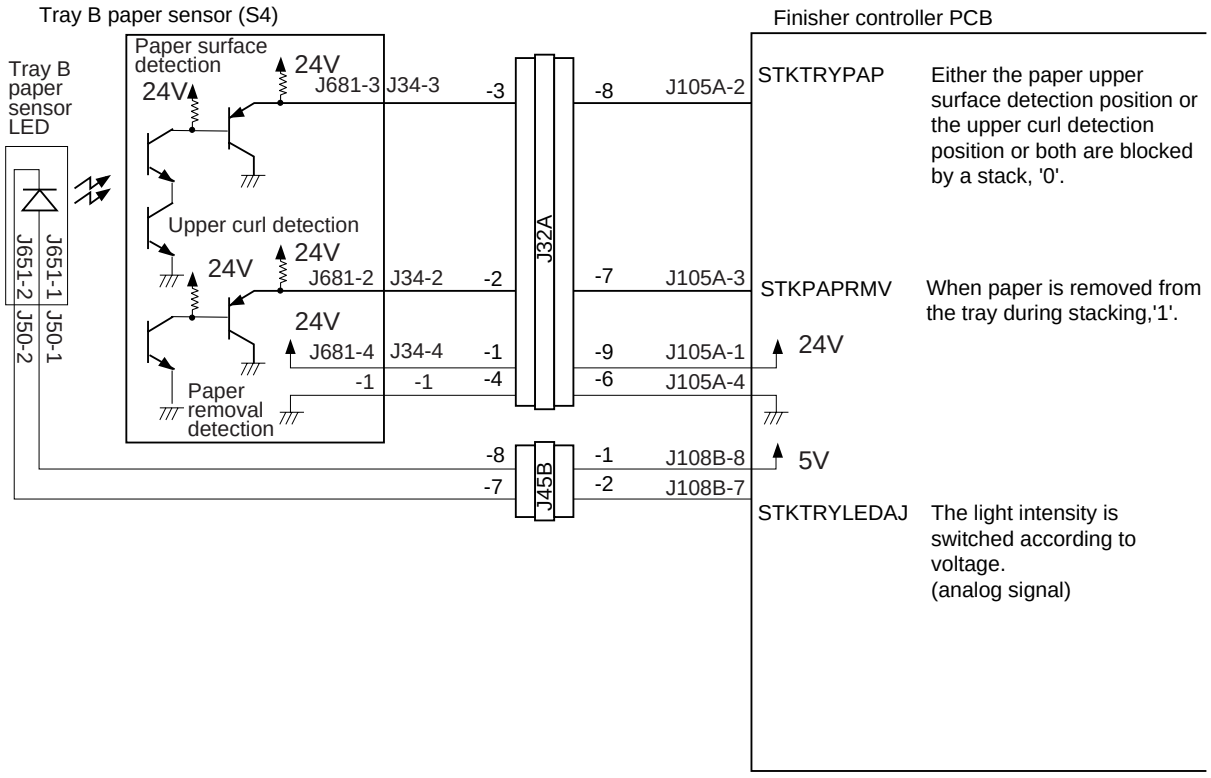

Figure 2-112

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11. Inputs to and Outputs from the Finisher Controller PCB

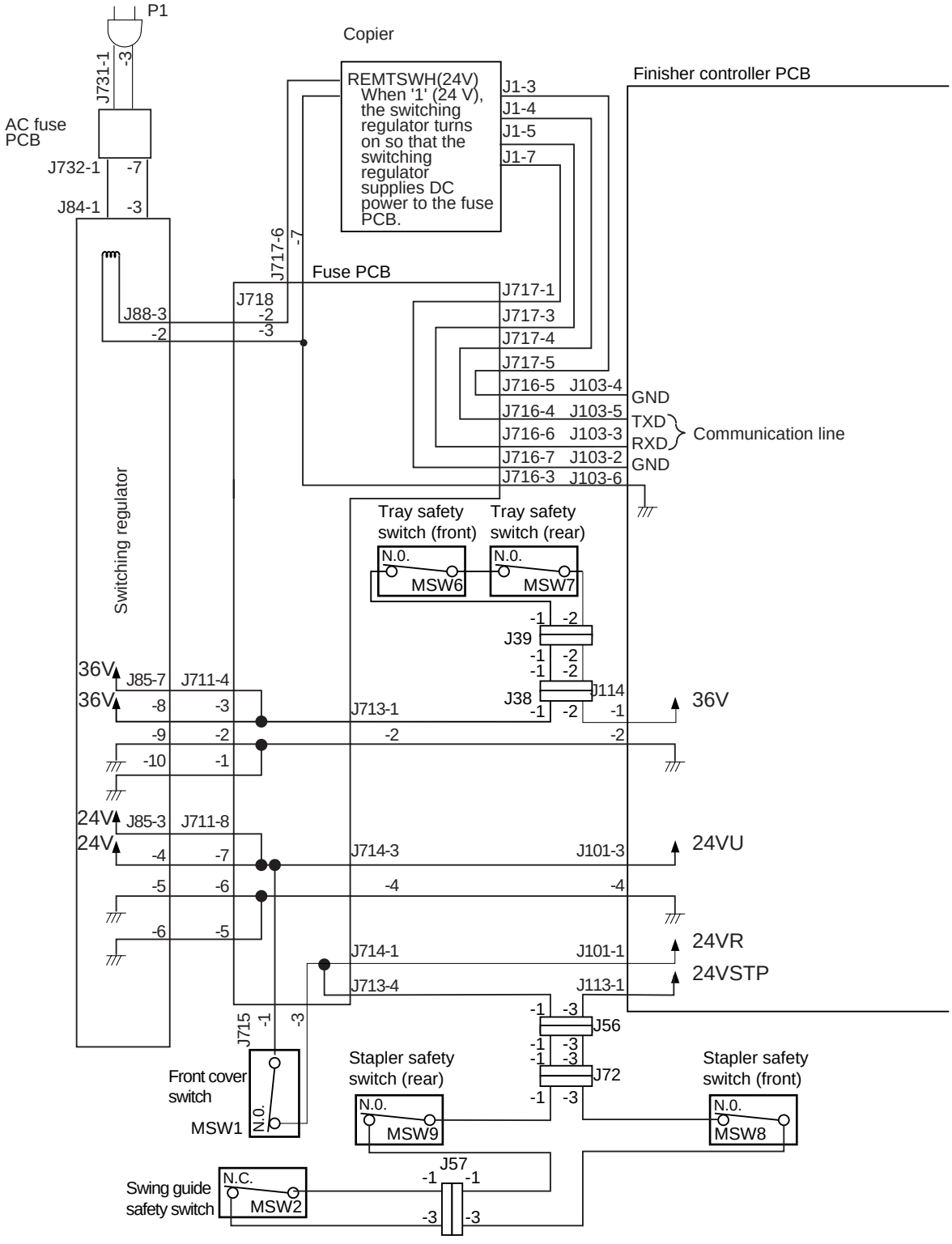

Figure 2-113

II . FEEDING/DRIVE SYSTEM

A. Outline

The machine operates in response to commands from its host copier for simple stacking, job offset, or stapling and deliver the sheets to the delivery tray.

The copier is equipped with two delivery trays: the top tray is the non-sort tray (tray A), and is used for simple stacking; the bottom tray is the sort tray, and is used for stapling and job offset and the sheets are delivered to the sort tray (tray B).

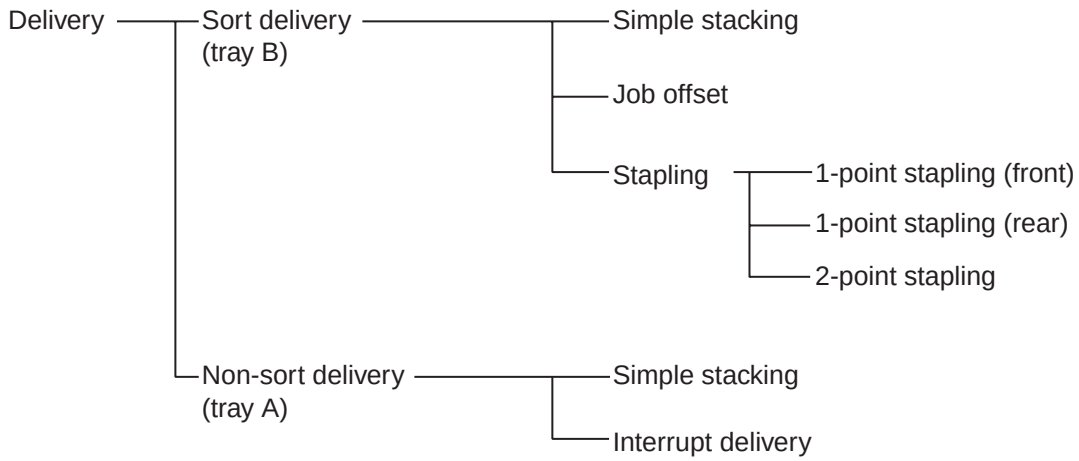

Figure 2-201

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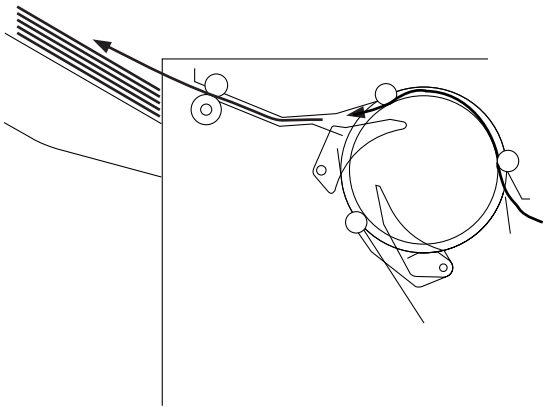
1. Normal Delivery

a. Simple Stacking



Directs sheets directly to the tray A.

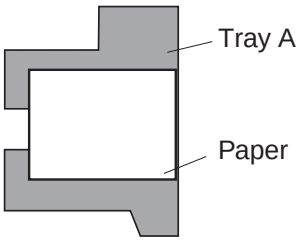


Figure 2-202

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b. Job Offset

Before being delivered to tray B, a sheet is first drawn into the processing tray once. The sheet is then moved to the front or rear by the jogging plate. The stack of sheets on the processing tray is delivered when it has collected a specific number of sheets.

Drawing in a Sheet

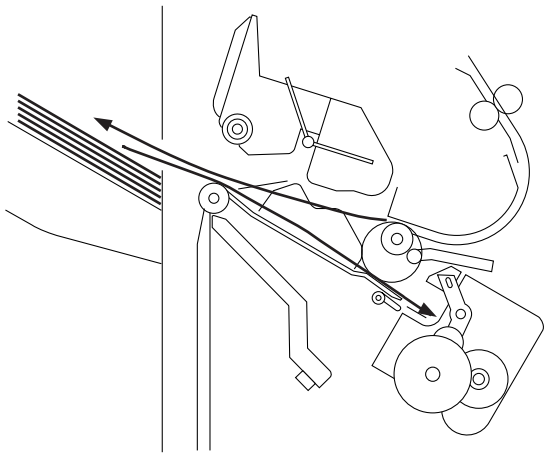

Figure 2-203

Delivering a Stack

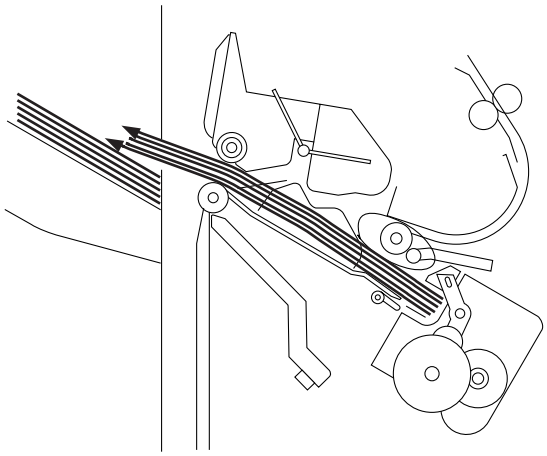

Figure 2-204

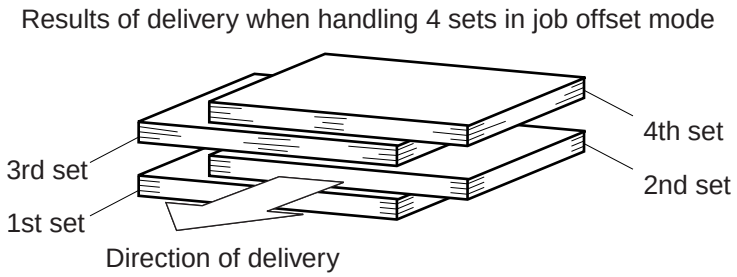

Figure 2-205

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c. Stapling

A sheet from the copier is deposited on the processing tray. When the stack has accumulated a specific number of sheets, the machine staples the stack and delivers it to tray B.

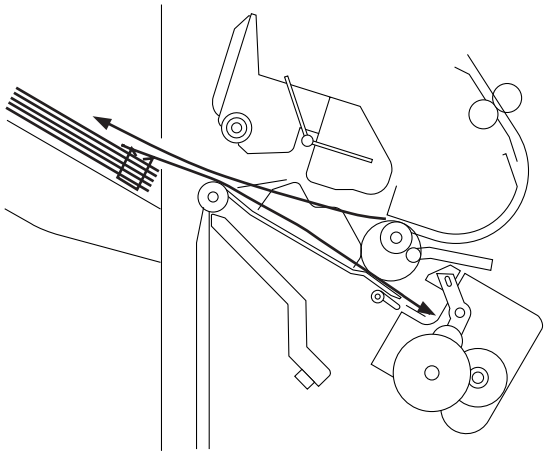

Figure 2-206

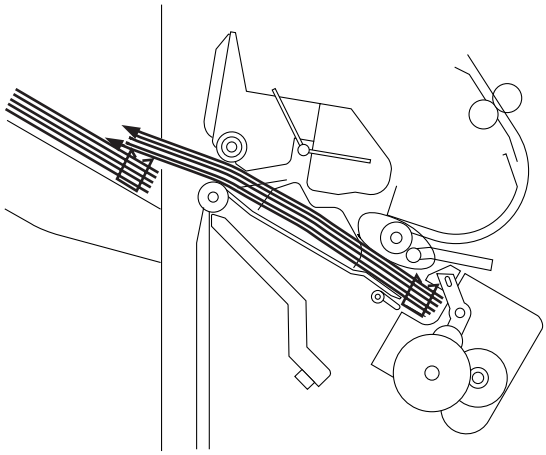

Figure 2-207

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d. Buffer Path

The machine is designed to accept sheets from the copier while it is handling sheets on the processing tray, calling for a device to enable simultaneous operation.

The machine's buffer roller allows wrapping of a maximum of three sheets of paper, during which job offset and stapling are executed on the processing tray.

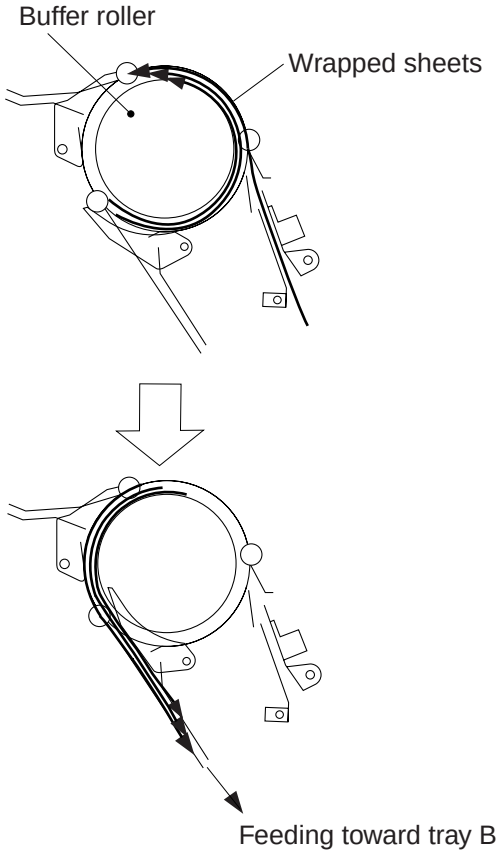

Figure 2-208

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B. Feeding/Delivery

1. Outline

The machine sends sheets from the copier to its tray A or tray B according to the selected mode of delivery, and performs job offset or stapling in response to commands from the copier.

The following table shows the motors used to feed or align sheets. These motors are controlled to rotate clockwise or counterclockwise as instructed by the finisher controller PCB.

The paper path is equipped by various sensors as shown, monitoring the arrival or passage of paper.

If paper fails to reach or move past a specific sensor within a specific period of time, the finisher controller PCB will identify the condition as a jam, stopping operation and informing the copier of the condition.

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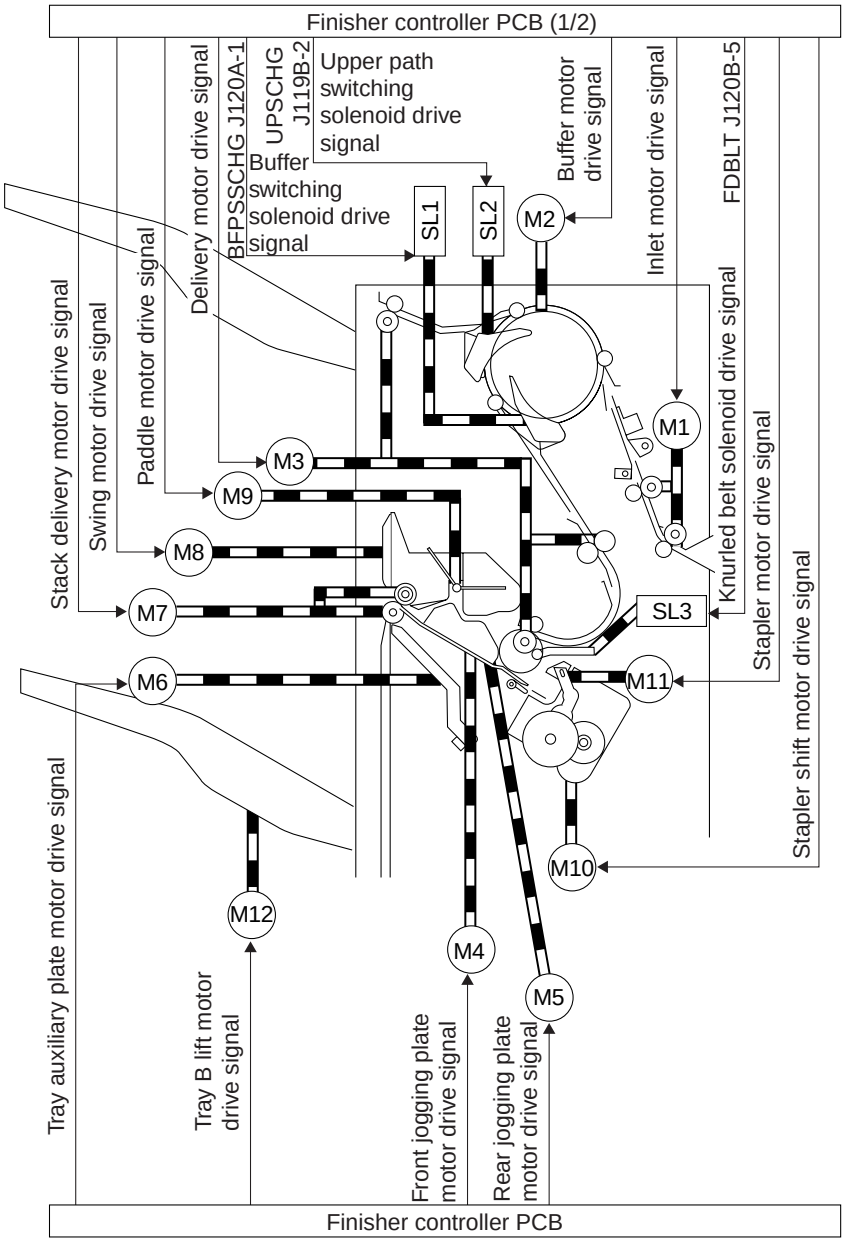

Figure 2-209

Notation	Name	Description	Connector on finisher controller PCB
M1	Inlet motor	4-phase stepping motor	J124
M2	Buffer motor	4-phase stepping motor	J122A
M3	Delivery motor	4-phase stepping motor	J122B
M4	Front jog motor	4-phase stepping motor	J104A
M5	Rear jog motor	4-phase stepping motor	J104A
M6	Tray auxiliary plate motor	4-phase stepping motor	J105A
M7	Stack paper motor	DC motor	J106
M8	Swing motor	DC motor	J106
M9	Paddle motor	4-phase stepping motor	J108A

Table 2-201

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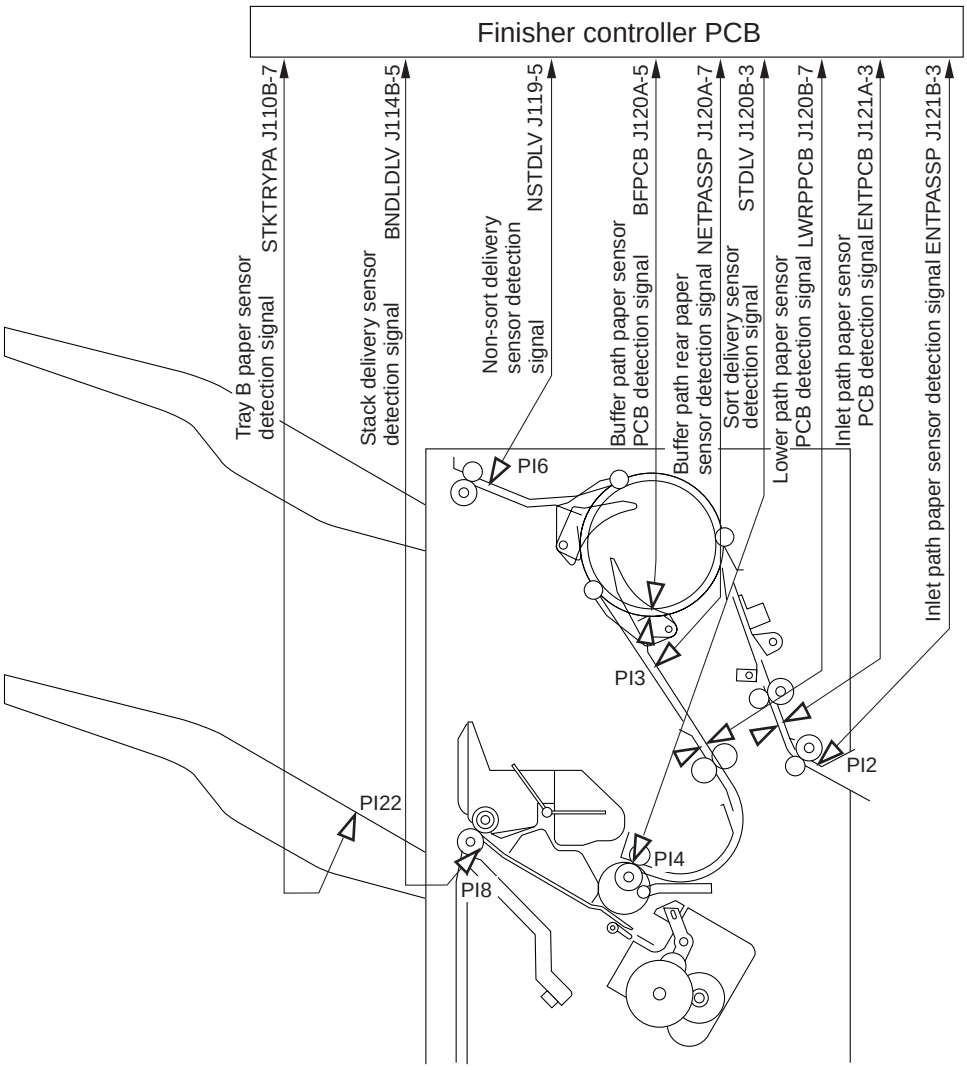
Finisher controller PCB
Tray B paper sensor detection signal STKTRYPA J110B-7
Stack delivery sensor detection signal BNDLDLV J114B-5
Non-sort delivery sensor detection signal NSTDLV J119-5
Buffer path paper sensor PCB detection signal BFPCB J120A-5
Buffer path rear paper sensor detection signal NETPASSP J120A-7
Sort delivery sensor detection signal STDLV J120B-3
Lower path paper sensor PCB detection signal LWRPPCB J120B-7
Inlet path paper sensor PCB detection signal ENTPCB J121A-3
Inlet path paper sensor detection signal ENTPASSP J121B-3
PI6
PI3
PI2
PI22
PI4
PI8

Figure 2-210

Notation	Name	Description	Connector on finisher controller PCB
PI2	Inlet path sensor	Photointerrupter	J121B
PI3	Buffer path rear sensor	Photointerrupter	J120A
PI4	Sort delivery sensor	Photointerrupter	J120B
PI6	Non-sort delivery sensor	Photointerrupter	J119A
PI8	Stack delivery sensor	Photointerrupter	J104B
PI22	Tray B paper sensor	Photointerrupter	J110B
S1	Inlet path paper sensor	Reflecting type sensor	J121B
S2	Buffer path paper sensor	Reflecting type sensor	J120B
S3	Lower path paper sensor	Reflecting type sensor	J120A
S4	Try B papers sensor	Transmission type	J105A

Table 2-202

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C. Job Offset

1. Outline

In job offset mode, stacks of sheets are moved to the front or rear for sorting purposes.

The stacks are moved to the front or rear by the front jogging plate and rear jogging plate. Sheets moving past the stack delivery roller are moved by the paddle in the direction of the stopper. The swing guide is in up position while pulling in a sheet or while the stacking plate is in operation; it is in down position while the stack is being delivered.

When the power is turned on, the finisher controller PCB drives the front jogging plate motor (M4) and the rear jogging plate motor (M5) to return the two jogging plates to the home position.

Sensor	Notation	Connector
Front jogging plate home position sensor	PI7	J104B-3
Rear jogging plate home position sensor	PI9	J104B-9
Swing guide closed sensor	PI15	J108B-3
Swing guide open sensor	PI16	J108B-6
Paddle home position sensor	PI14	J108A-8

Table 2-203

Function	Motor	Notation
Drives the front jogging plate	Front jogging plate motor	M4
Drives the rear jogging plate	Rear jogging plate motor	M5
Swing guide drive	Swing motor	M8
Drives the paddle (feeds paper)	Paddle motor	M9

Table 2-204

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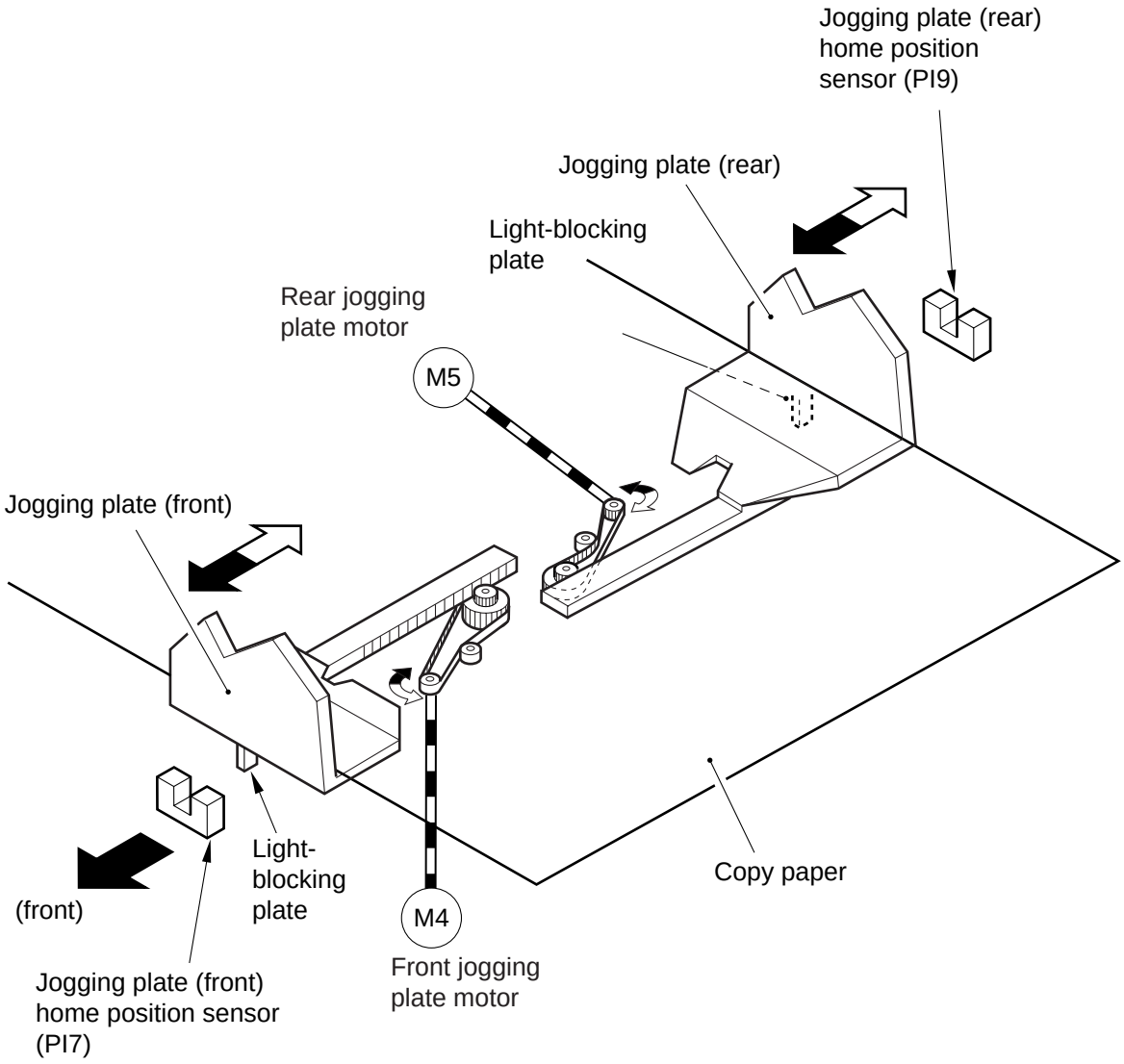
Jogging plate (rear)
home position
sensor (PI9)
Jogging plate (rear)
Light-blocking
plate
Rear jogging
plate motor
M5
Jogging plate (front)
(front)
Light-
blocking
plate
M4
Front jogging
plate motor
Copy paper
Jogging plate (front)
home position sensor
(PI7)

Figure 2-211

2. Stacking Sheets for the Processing Tray

a. Handling the First Sheet

The tray auxiliary plate is outside the machine before the first sheet moves past the delivery roller. (It, however, may be inside the machine under certain conditions.)

The swing guide moves up when the trailing edge of the sheet moves past the sort delivery sensor (PI4), releasing the sheet from the stack delivery roller.

Then, the paddle taps on the top surface of the sheet, and butts the trailing edge of the sheet against the processing tray stopper. The paddle rotates in numbers determined by paper size and the number of sheets contained in the stack. (Usually, it rotates two to three times.)

The stack delivery roller starts to rotate in reverse in keeping with the rotation of the paddle to assist butting the sheet against the stopper.

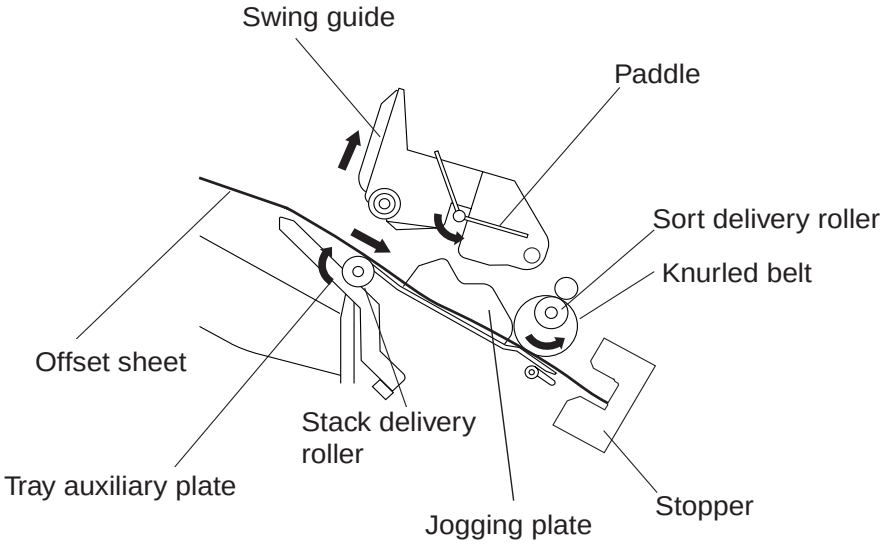

Figure 2-212

b. Handling the Second and Subsequent Sheets

When the trailing edge of the second and subsequent sheets moves past the delivery sensor, the paddle starts to tap the top surface of the sheet, butts its trailing edge against the processing tray stopper, and deposits it on top of the existing stack. The tray auxiliary plate remains outside the machine.

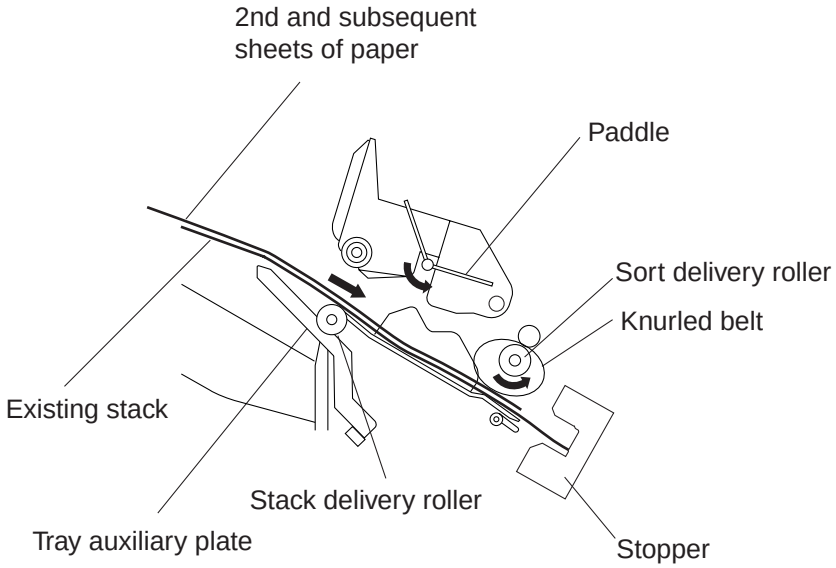

Figure 2-213

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c. Offset Operation

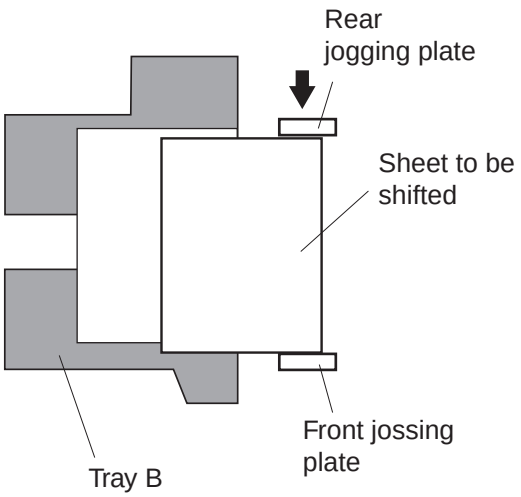
The front or the rear jogging plate shifts each sheet that arrives toward the front or rear. The direction will be

i. If a sheet exists on tray B, in the direction opposite it.
ii. If no sheet exists on tray B, depends on the selected paper size and mode.

When shifting to the front, the machine uses the front jogging plate as the reference for butting, causing the rear jogging plate to move the sheet toward the front.

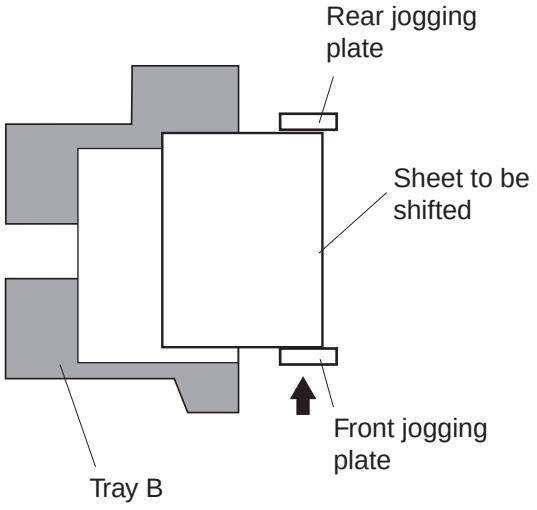
When shifting to the rear, the machine uses the rear jogging plate as the reference for butting, causing the front jogging plate to move the sheet to the front.

The machine executes offset operation each time a sheet is pulled onto the processing tray.



Shifting to the Front

Figure 2-214



Shifting to the Rear

Figure 2-215

d. Stack Delivery

A stack is delivered when as many as five (three in the case of large-size sheets) have been deposited on the processing tray.

The swing guide motor rotates to move down the swing guide. The upper and lower stack delivery rollers then hold the stack in between. When the stack delivery motor starts to rotate, the stack held between the delivery rollers is discharged; at the same time, the tray auxiliary plate is retracted inside the machine.

The sheet coming from the copier to the finisher while the stack is being discharged is wrapped around the buffer roller.

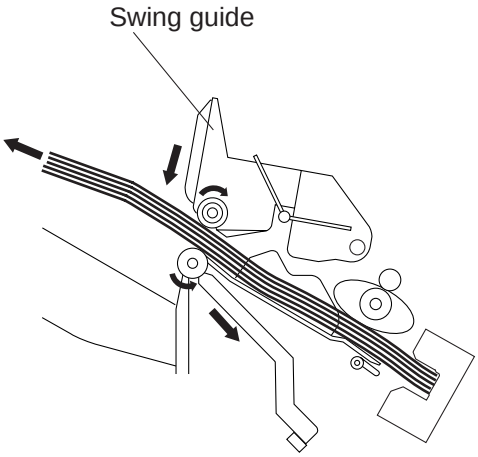


Figure 2-216

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3. Number of Sheets for an Offset Job

A stack is discharged when it has collected five sheets (small-size) or three sheets (large-size). If the number of sheets for a specific offset job cannot be divided by 5 or 3, the last stack will be discharged falling short of the full count.

If, for example, 5n + 1, the last stack will contain one sheet. In such a case, the second stack from the last will be discharged containing four sheets to avoid discharging a single sheet. In the example, the last stack will consist of two sheets.

EX.

1. For eight small-size sheets, the combination will be a 5-sheet stack and a 3-sheet stack.
2. For ten small-size sheets, the combination will be a 5-sheet stack and a 5-sheet stack.
3. For 16 small-size sheets, the combination will be a 5-sheet stack, 5-sheet stack, 4-sheet stack, and a 2-sheet stack.

Reference:

Why Avoid a Single-Sheet Stack?

A single sheet of paper tends to deviate from the paper path from the stack discharge slot to the stacks existing on tray B, disrupting the alignment of the stacks.

In the case of large-size sheets, each delivered stack will consist of three sheets. However, if the last stack ends up consisting of one or two sheets, no adjustment will be made to the stack immediately preceding it.

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Sequence of Operations
·Two 2-Sheet Stacks

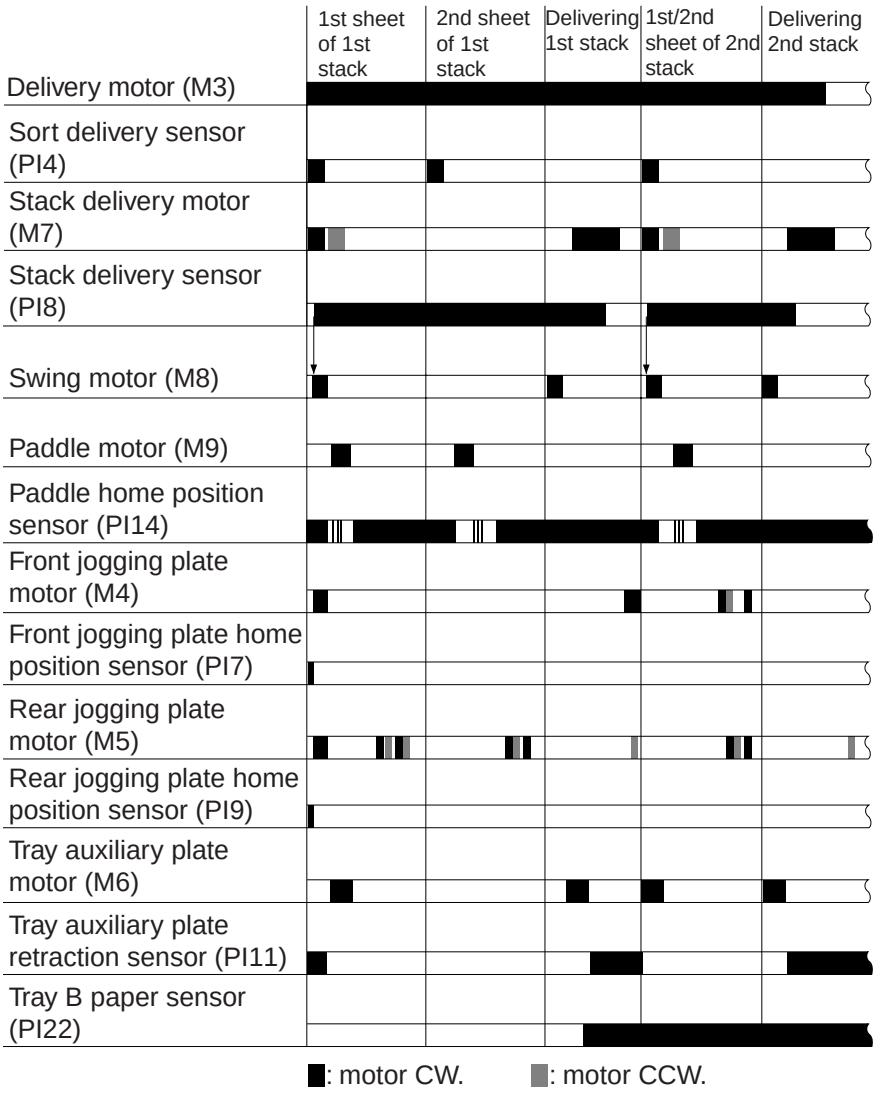
1st sheet of 1st stack
2nd sheet of 1st stack
Delivering 1st stack
1st/2nd sheet of 2nd stack
Delivering 2nd stack
Delivery motor (M3)
Sort delivery sensor (PI4)
Stack delivery motor (M7)
Stack delivery sensor (PI8)
Swing motor (M8)
Paddle motor (M9)
Paddle home position sensor (PI14)
Front jogging plate motor (M4)
Front jogging plate home position sensor (PI7)
Rear jogging plate motor (M5)
Rear jogging plate home position sensor (PI9)
Tray auxiliary plate motor (M6)
Tray auxiliary plate retraction sensor (PI11)
Tray B paper sensor (PI22)
: motor CW.
: motor CCW.

Figure 2-217

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D. Releasing the Knurled Belt

1. Outline

The sheet which has moved past the sort delivery roller is sent to the knurled belt by the paddle and the stack delivery roller. However, the knurled belt is released for the following to avoid the effects on the movement to the processing tray occurring if the sheet was kept in contact with the knurled belt.

a. If three sheets arrive at the same time from the buffer roller (3-sheet delivery).
b. If multiple sheets (40 or more) already exist on the processing tray.

The knurled belt is released by the knurled belt solenoid (SL3).

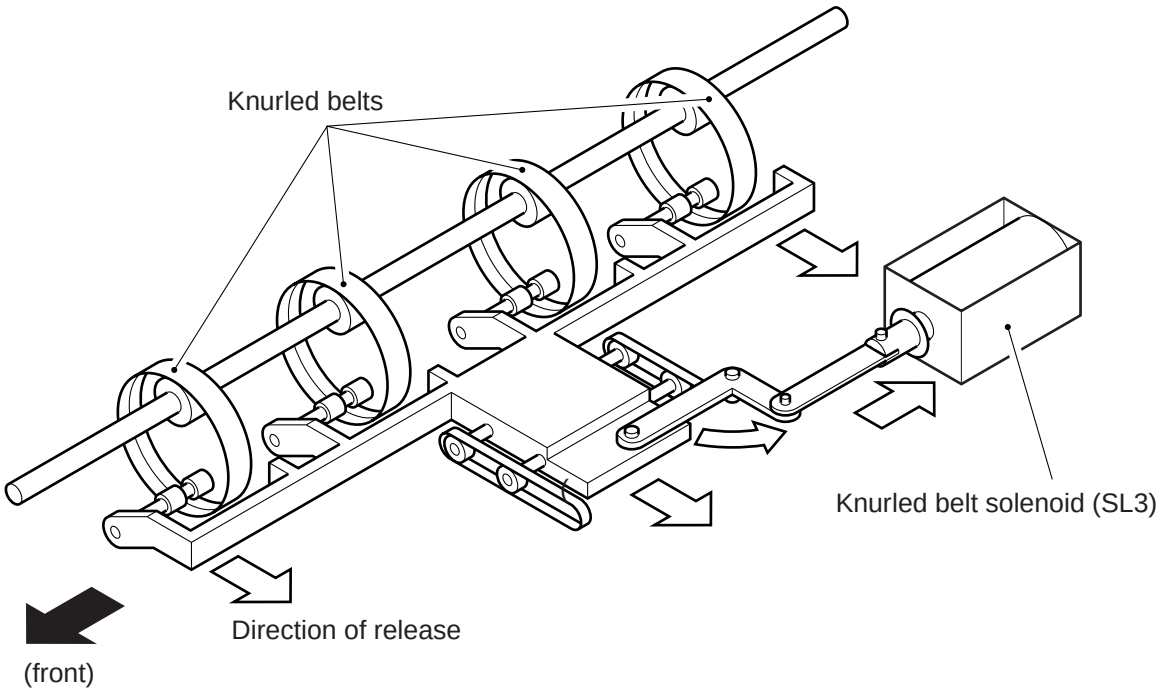

Figure 2-218

2. Discharging Three Sheets

If three sheets have moved past the sort delivery roller from the buffer roller, the stack delivery roller will rotate in reverse to send the stack of three sheets in the direction of the processing tray.

If the knurled belt moved the stack of three sheets, the force of feeding would be too strong that the stack would bend against the stopper. To avoid such a problem, the knurled belt is released and the stack delivery roller and the paddle operate to move the 3-sheet stacks to the processing tray.

1. The stack moves past the sort delivery roller. At the same time, the knurled belt solenoid turns on to release the knurled belt.

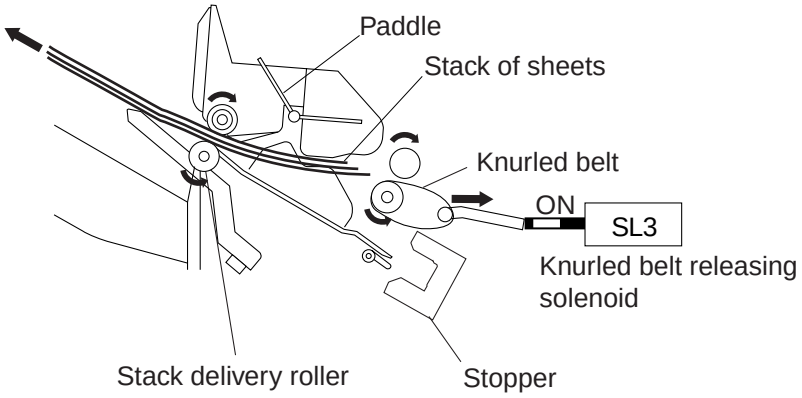

Figure 2-219

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2. The stack delivery roller starts to rotate in reverse and, at the same time, the paddle rotates to move the stack in the direction of the processing tray.

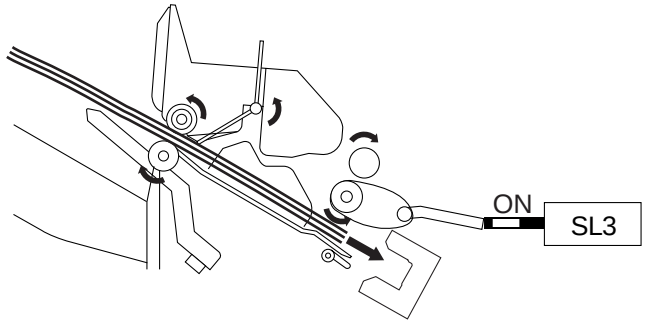

Figure 2-220

3. The belt is locked once again as soon as the stack butts against the stopper.

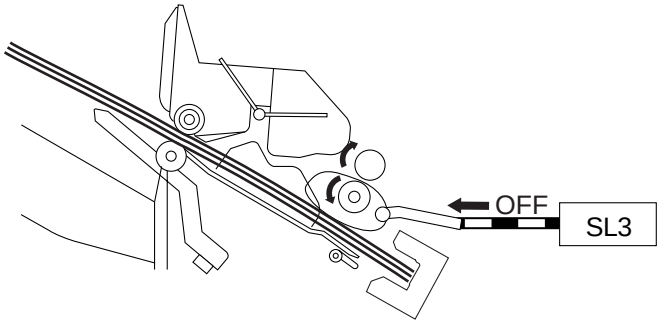

Figure 2-221

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3. Multiple Sheets on the Processing Tray

When multiple sheets are stacked on the tray, the knurled belt could put the stack back to its initial position after alignment. (Excess sheets could also interfere with the rotation of the knurled belt.)

To avoid such a problem, the knurled belt is released if 40 or more sheets exist on the processing tray.

1. The trailing edge of the sheet moves past the delivery roller, and the sheet is butted against the stopper by the paddle and the knurled belt.

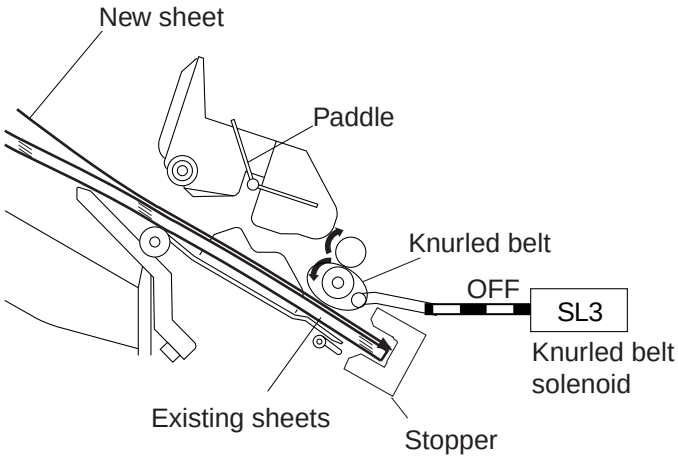

Figure 2-222

2. The solenoid turns on in keeping with the alignment of the sheet to release the knurled belt.

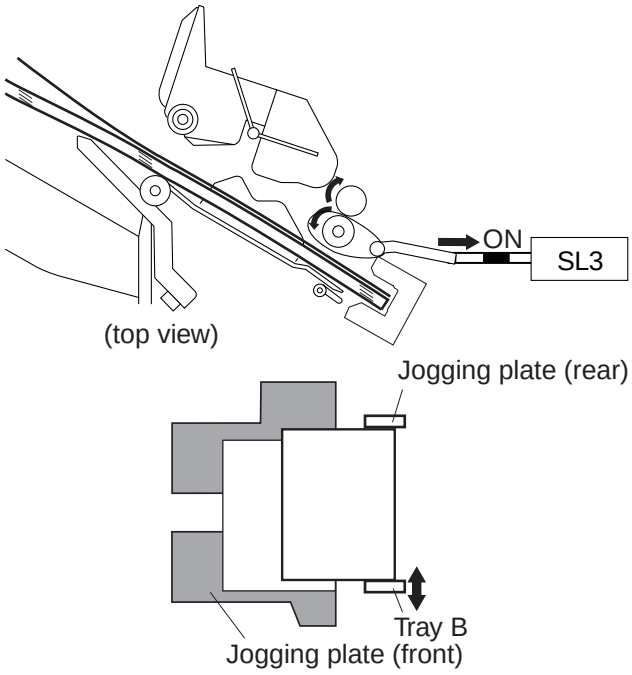

Figure 2-223

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3. When the next sheet arrives, the solenoid turns off, and the knurled belt moves the sheet in the direction of the stopper.

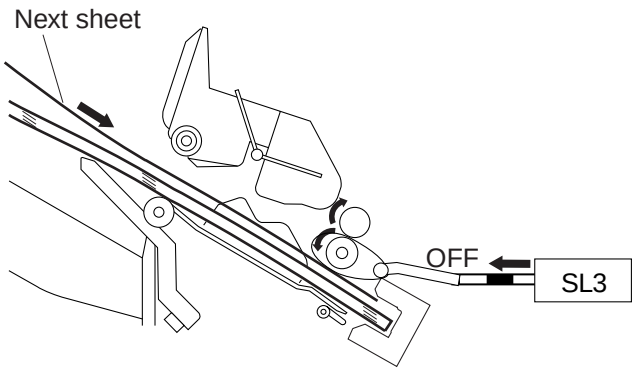

Figure 2-224

4. The solenoid turns on when discharge starts, moving the stack away from the knurled belt. The solenoid remains on if the next discharge is for a three-sheet stack.

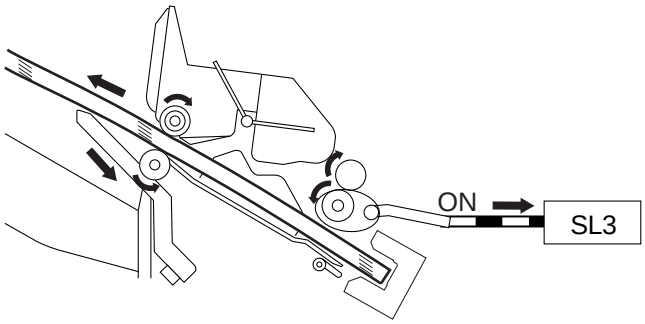

Figure 2-225

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E. Buffer Path

To accept sheets from the copier continuously while the machine handles sheets on the processing tray, the machine is equipped with a buffer roller, which operates as follows:

1. The first sheet is moved in the direction of the buffer roller.

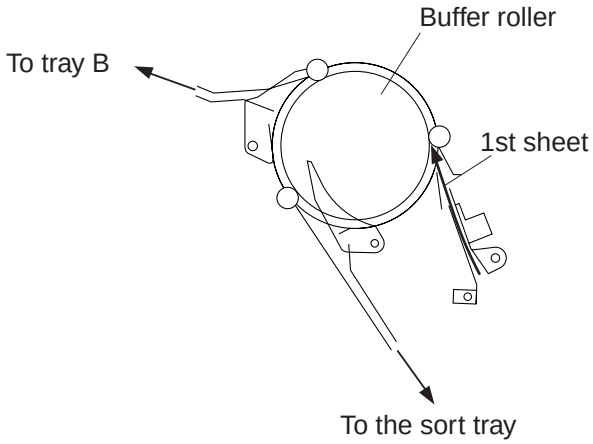

Figure 2-226

2. Since the upper path switching flapper remains off, the leading edge of the sheet moves in the direction of the buffer path switching flapper.

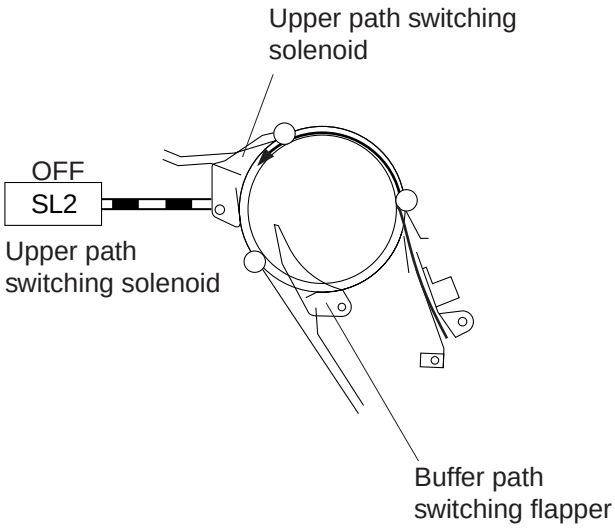

Figure 2-227

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3. The buffer path switching flapper operates, causing the leading edge of the sheet to wrap around the buffer roller.

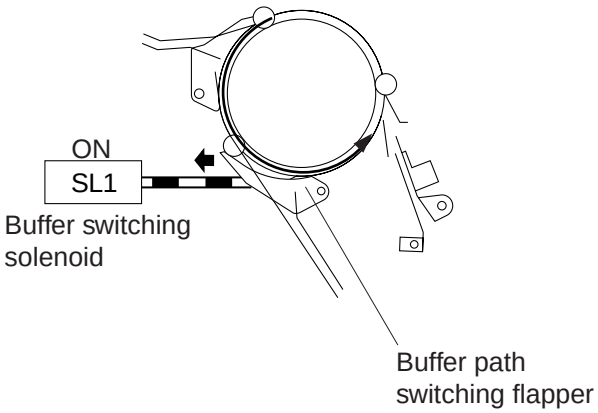

Figure 2-228

4. The second sheet arrives from the copier.

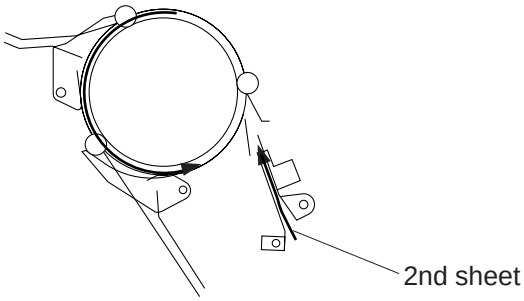

Figure 2-229

5. The leading edge of the second sheet moves ahead of the leading edge of the 1st sheet.

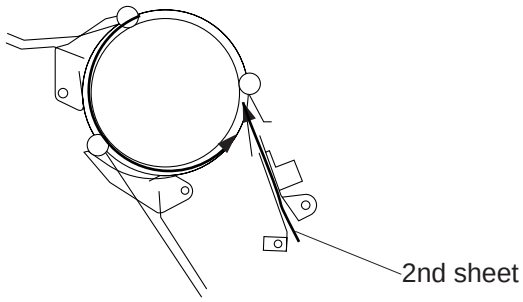

Figure 2-230

6. The buffer roller continues to rotate, causing the second sheet to slide over the first sheet.

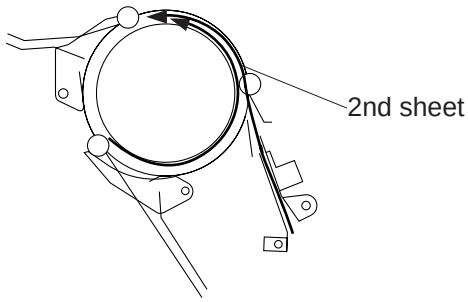

Figure 2-231

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7. The third sheet arrives from the copier.

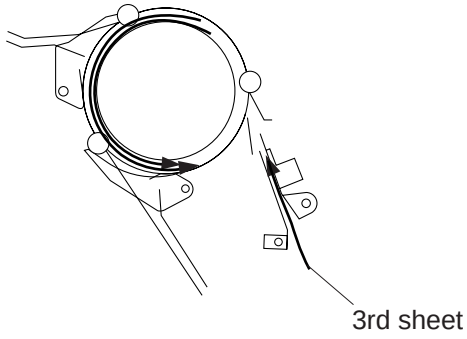

Figure 2-232

8. The leading edge of the third sheet moves ahead of the leading edge of the second sheet.

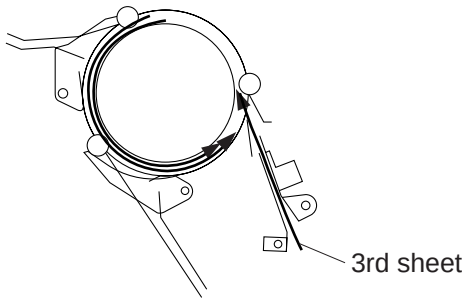

Figure 2-233

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9. The buffer roller continues to rotate, causing the third sheet to slide over the first and third sheets.

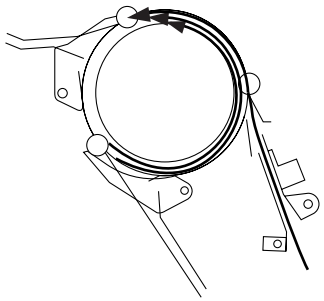

Figure 2-234

10. The buffer path switching flapper turns off, causing the three sheets to move in the direction of the delivery roller together.

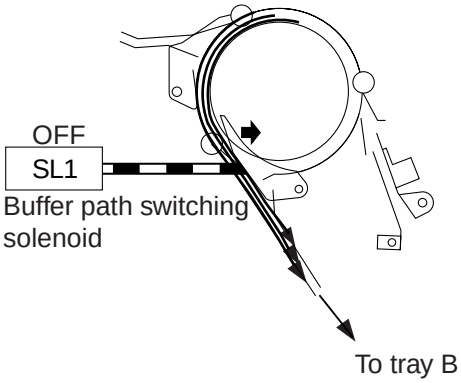

Figure 2-235

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III . CONTROLLING THE PADDLE

1. Outline

The paddle serves to move the sheets delivered to the processing tray in the direction of the stopper.

Sensor	Notation	Connector
Paddle home position sensor	PI14	J108A-8

Table 2-301

Function	Motor	Notation
Drives the paddle	Paddle motor	M9

Table 2-302

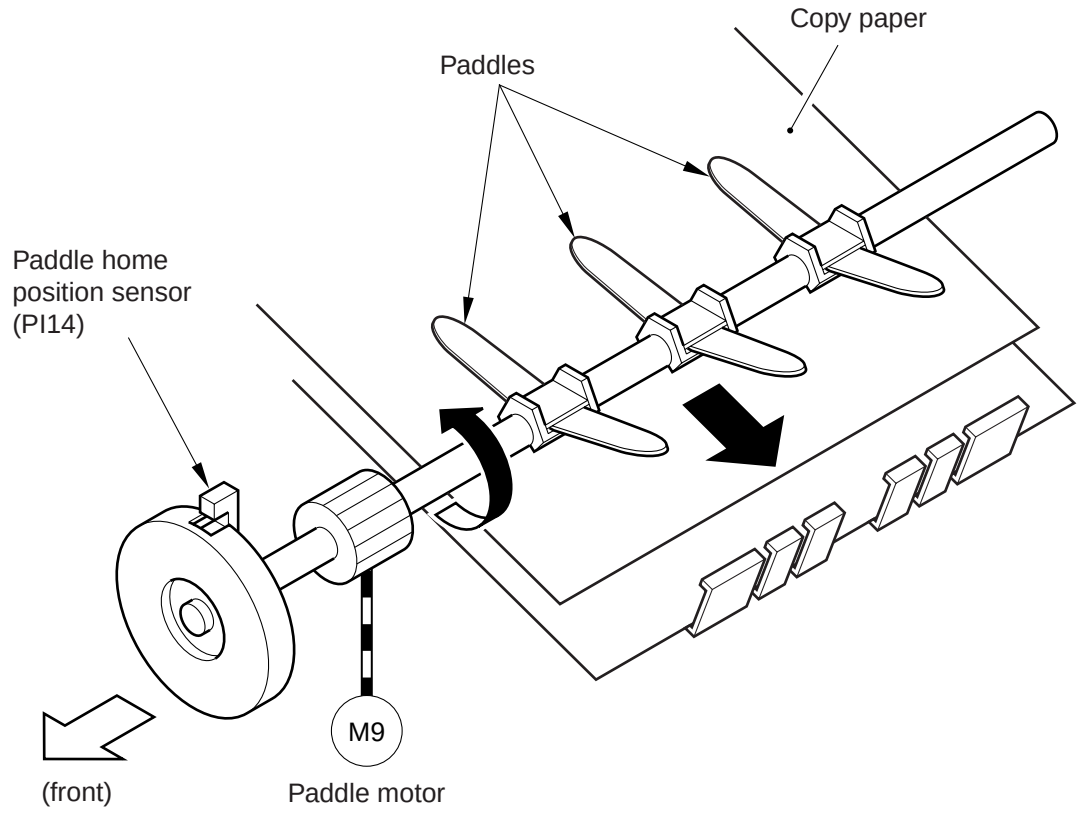

Figure 2-301

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IV . CONTROLLING THE TRAY AUXILIARY PLATE

1. Outline

The front half of sheets are pushed off tray B when the machine performs stapling or offset operation, and the tray auxiliary plate is used to ensure the best placement of the leading edges of the sheets.

Sensor	Notation	Connector
Tray auxiliary plate retraction sensor	PI11	J105B-6

Table 2-401

Function	Motor	Notation
Drives the tray auxiliary plate	Tray auxiliary plate motor	M6

Table 2-402

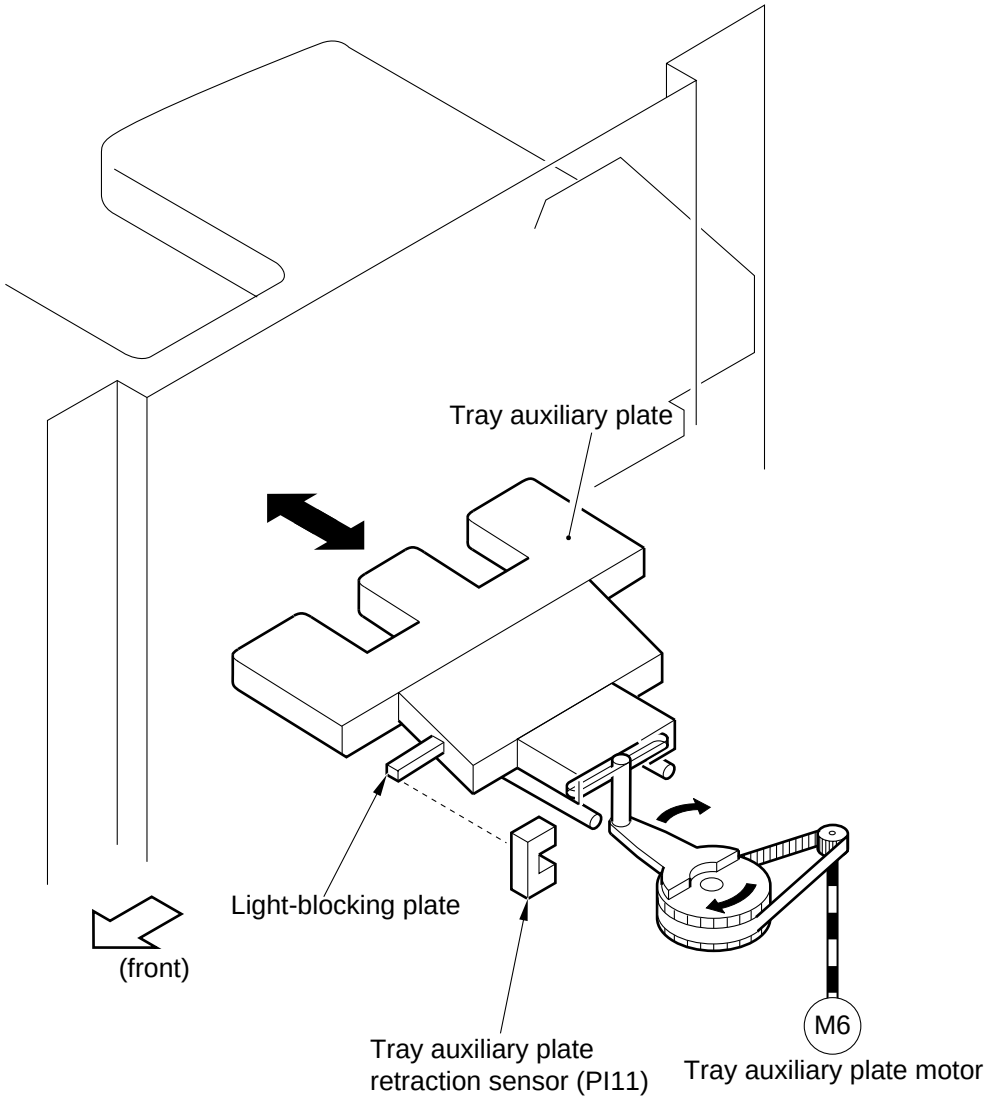

Figure 2-401

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2. Operation

When multiple sheets are stacked on tray B, the leading edge of the stack tends to bend down, and would flap down if the stack was moved halfway off the processing tray, preventing the sheets to move against the stopper despite tapping by the paddles and, ultimately, causing the following:

a. Poor alignment of sheets in feeding direction at time of stapling
b. Poor alignment of sheets in feeding direction at time of an offset job (on tray B)

To prevent the above, the DC controller PCB slides the tray auxiliary plate outside the machine while sheets are being placed on the processing tray. With the tray auxiliary plate supporting the sheets from below, the stack will lie straight maintaining correct alignment.

Since the tray auxiliary plate is retracted when discharging stacks, it will not affect delivery. The plate is slid out once again when the next sheet is placed on the processing tray (after detecting the paper surface to prevent interference with detection).

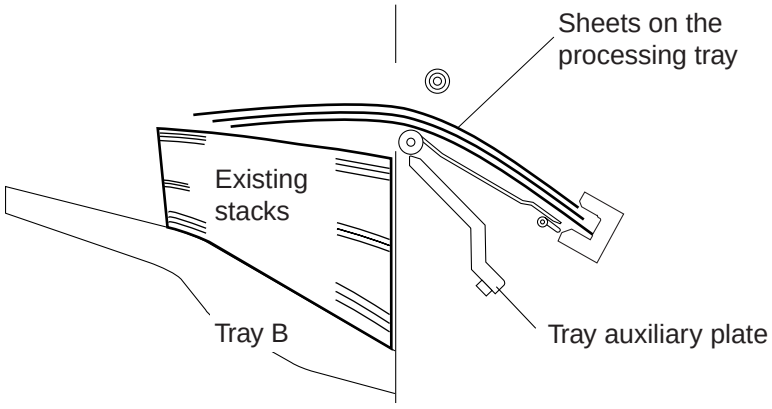

Figure 2-402 (Tray Auxiliary Plate Retracted)

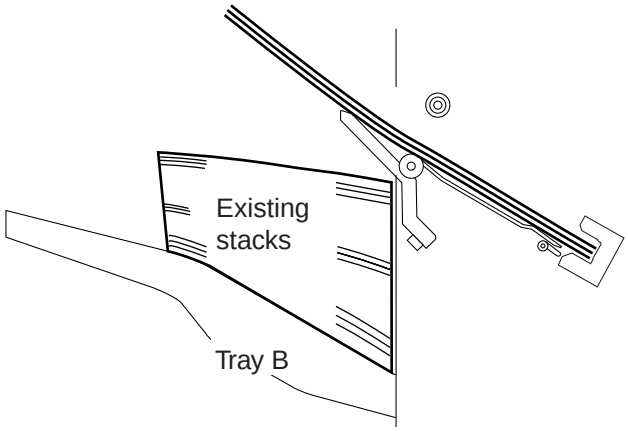

Figure 2-403 (Tray Auxiliary Plate Out)

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V . STAPLING

1. Outline

A specific number of sheets are stacked on the processing tray, and are stapled and delivered.

The stapling position varies according to stapling mode and paper size. When the power is turned on, the finisher controller PCB drives the stapler shift motor to return the stapler to the home position. If the stapler is already in the home position, it is made to wait as it is.

Sensor	Notation	Connector	Functions	Remarks
Stapler shift home position sensor	PI17	J112-8	Checks the stapler home position in the front and rear directions.	-
Staple edging sensor	PI18	J111-13	Checks the staple edging operation.	Inside the stapler
Stapling home position sensor	PI19	J111-11	Checks the stapling home position.	
Staple detecting switch	MSW3	J111-9	Checks the presence/absence of staples inside the cartridge.	
Cartridge switch	MSW4	J111-10	Checks the presence/absence of a cartridge.	

Table 2-501

Function	Motor	Notation	Reference
Stapler shift drive	Stapler shift motor	M10	-
Stapling drive	Stapler motor	M11	Inside the stapler

Table 2-502

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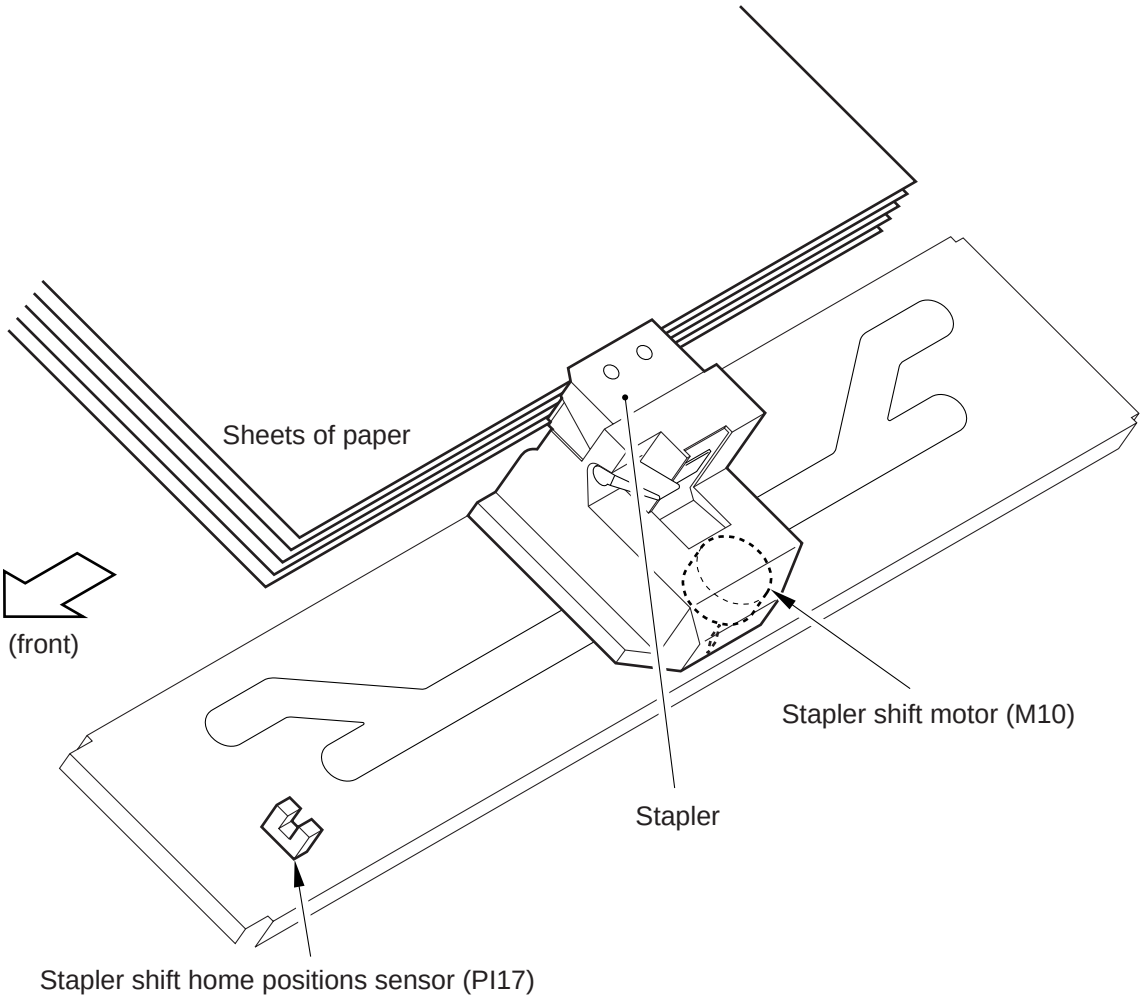

Figure 2-501

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2. First Sheet for Stapling

When the trailing edge of the first sheet moves past the sort delivery roller after it has been moved for a specific length, the stack delivery roller rotates in reverse to move the sheet farther. Then, the swing guide moves up, and the stack delivery roller stops. The upward movement of the swing guide is monitored by the swing guide open sensor (PI16).

The knurled belt, working in conjunction with the swing guide and the sort delivery roller, sends the sheet to the processing tray. The swing guide remains up until the last sheet has been deposited. The sheets on the processing tray are detected by the stack delivery sensor (PI8).

The finisher controller PCB drives the aligning plate in keeping with the sheets butting against the stopper to keep the edges of the sheets flush. The front or rear Jogging plate is used depending on the side on which the most recent existing stack is found.

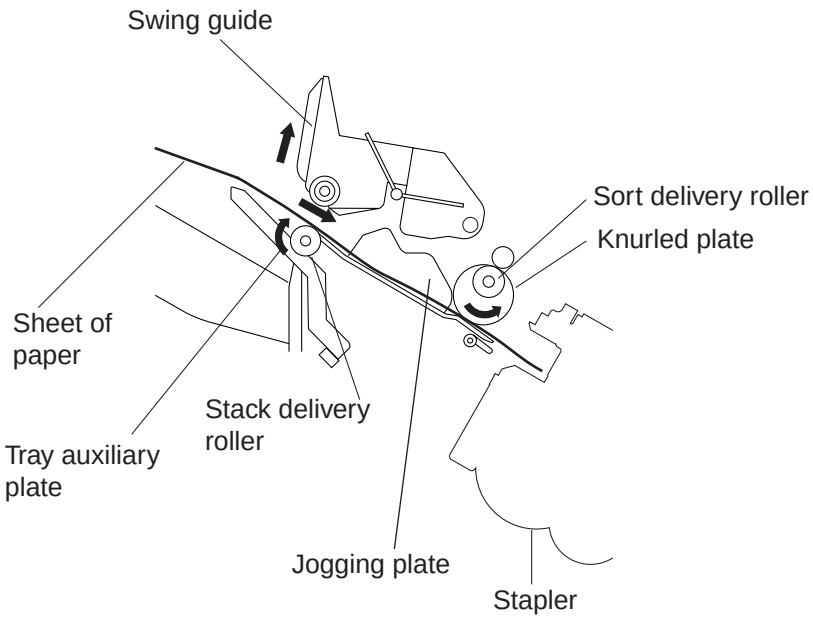

Figure 2-502

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3. Second and Subsequent Sheets for Stapling

As soon as the second or subsequent sheet moves past the sort delivery roller, the paddle motor turns on to rotate the paddle. The sheet is pushed by the paddle to the processing tray. The number of paddling operations varies according to the paper size (usually two to three times).

When the sheet reaches the processing tray, the jossing plate operates to put it in order. The direction of jogging is controlled in the same way as jogging the first sheet for stapling.

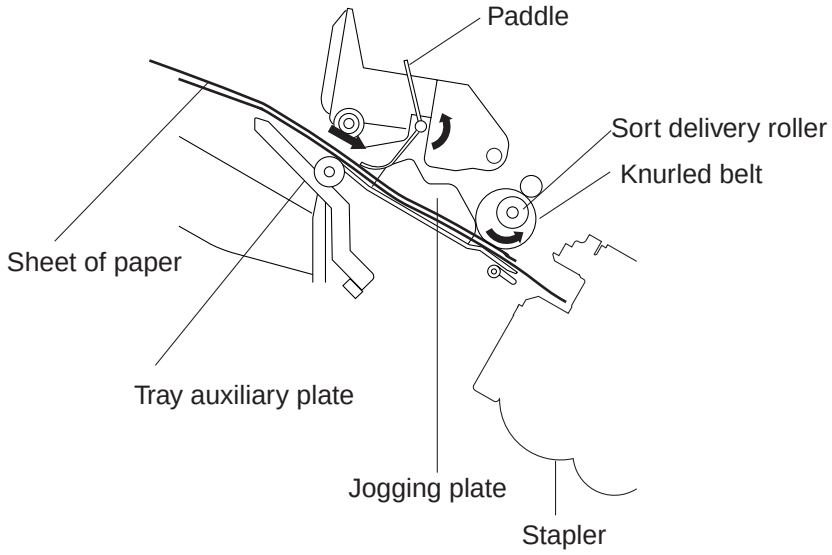

Figure 2-503

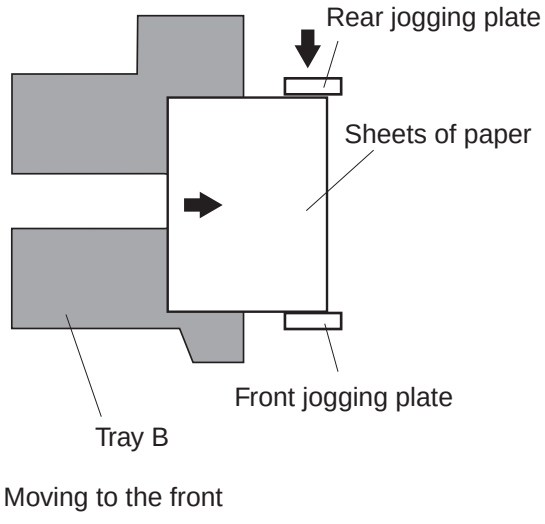

Figure 2-504

4. Last Sheet for Stapling

When jogging operation ends for the last sheet, the front and rear jogging plates operate to hold the sheets; thereafter, the swing motor starts to rotate to move down the swing guide. Then, the finisher controller PCB moves the stapler to suit the selected stapling position for stapling operation.

When stapling ends, the finisher controller drives the jogging motor to move the jogging plate 10 mm away from the sheet. Thereafter, the stack delivery motor (M7) rotates clockwise to discharge the stack to tray B.

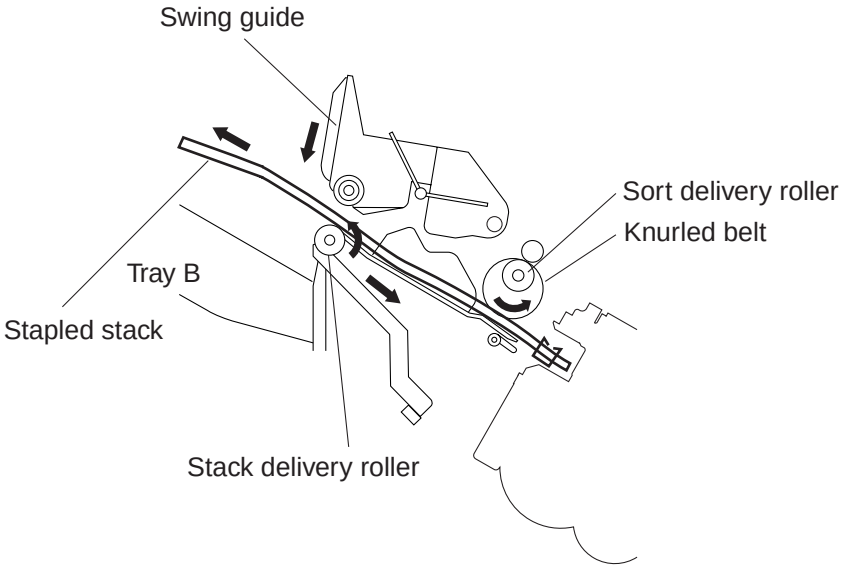

Figure 2-505

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Sequence of Operations
(3 sheets, 2-point stapling)

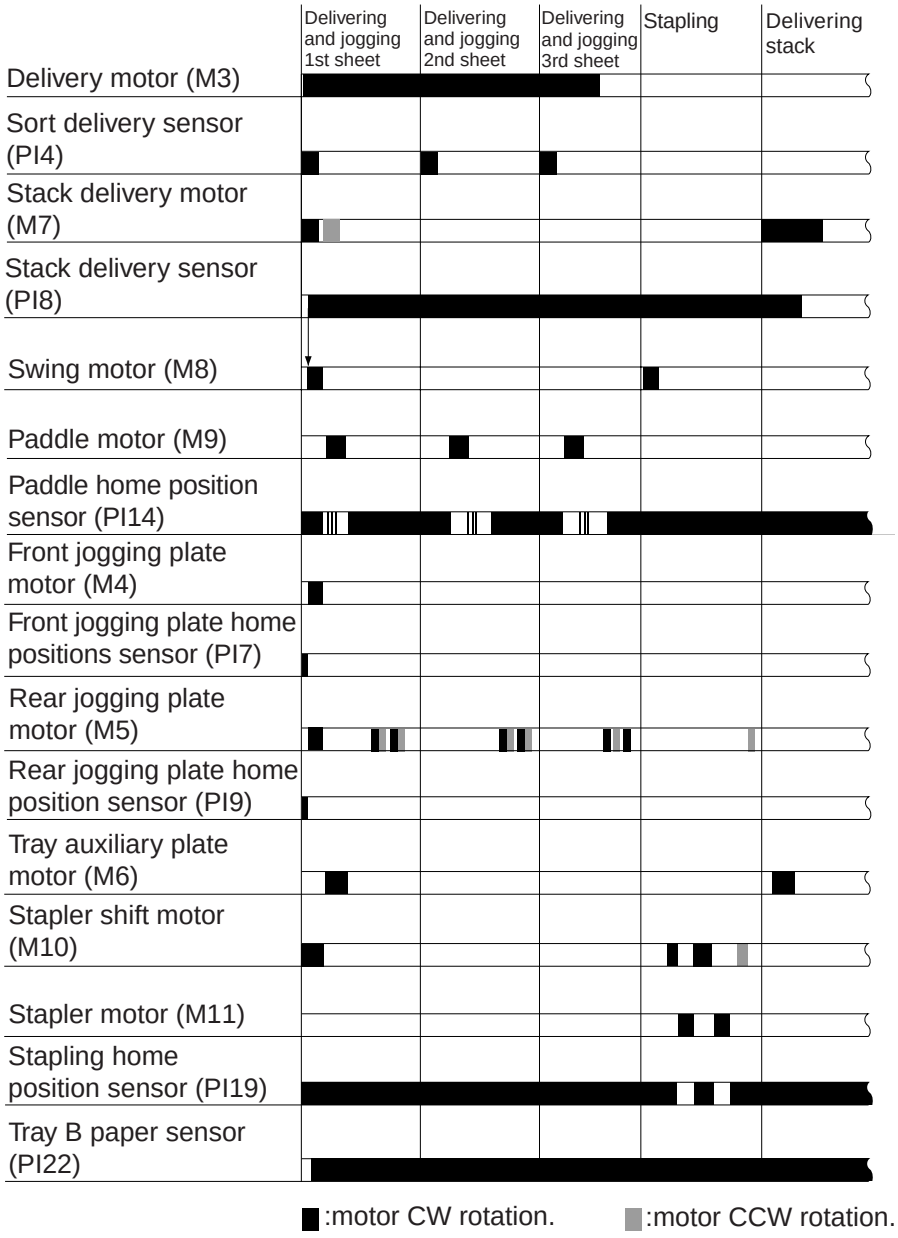
Delivering and jogging 1st sheet
Delivering and jogging 2nd sheet
Delivering and jogging 3rd sheet
Stapling
Delivering stack
Delivery motor (M3)
Sort delivery sensor (PI4)
Stack delivery motor (M7)
Stack delivery sensor (PI8)
Swing motor (M8)
Paddle motor (M9)
Paddle home position sensor (PI14)
Front jogging plate motor (M4)
Front jogging plate home positions sensor (PI7)
Rear jogging plate motor (M5)
Rear jogging plate home position sensor (PI9)
Tray auxiliary plate motor (M6)
Stapler shift motor (M10)
Stapler motor (M11)
Stapling home position sensor (PI19)
Tray B paper sensor (PI22)
:motor CW rotation.
:motor CCW rotation.

Figure 2-506

5. Stapler

Stapling is performed by the staple motor (M11). For each rotation of the cam, the cam home position is checked by the stapling home position sensor (PI19). The microprocessor (IC121) of the finisher controller PCB controls the stapler motor, rotating it clockwise or counterclockwise.

When the stapler home position sensor is off, the finisher controller PCB rotates the stapler motor counterclockwise until the sensor turns on to return the stapling cam to its initial state.

The presence of a staple cartridge is checked by the staple cartridge switch (MSW4), while the presence of staples inside the cartridge is checked by the staple switch (MSW3). The staple edging sensor (PI18) is used to find out whether the staples inside the staple cartridge have been edged to the tip of the stapler.

The power line to the stapler motor (M11) is connected and disconnected by the microswitches shown in Table 2-503, serving as a safety measure to prevent injuries.

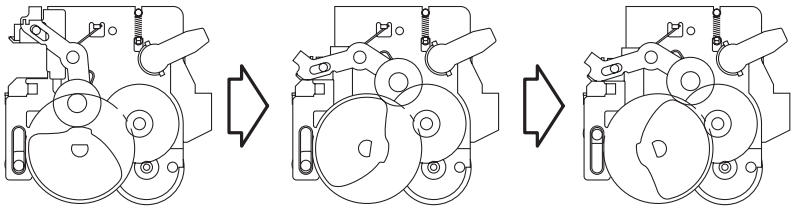

Figure 2-507

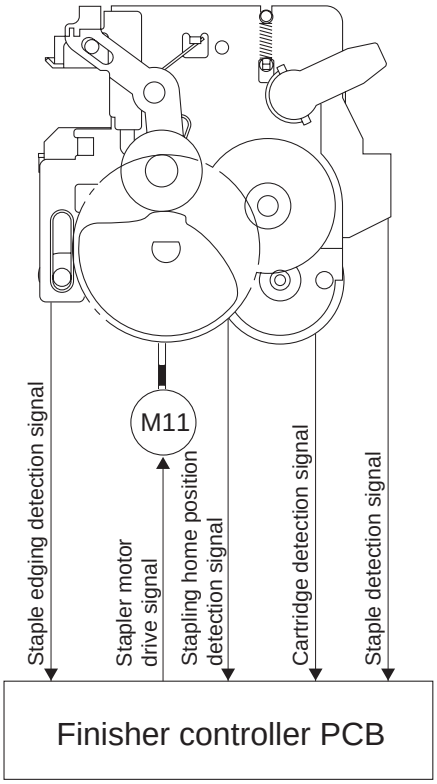

Figure 2-508

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Microswitch	Notation	State	Description
Front cover switch	MSW1	NO	Connects when the front cover is closed.
Swing guide safety switch	MSW2	NC	Connects when the swing guide is closed.
Stapler safety switch (front)	MSW8	NO	Connects when the stacking wall (upper) is mounted correctly and the stacking wall actuator is down.
Stapler safety switch (rear)	MSW9	NO	

Table 2-503

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VI . TRAY MOVEMENT

1. Outline

The machine is equipped with two delivery trays: tray B is designed to move up and down, and tray A is fixed in position.

The drive gear assembly of the tray is equipped with a tray B locked sensor (PI23). If the sensor state does not change because of a fault in the motor despite the application of drive signals to tray B shift motor, the finisher controller PCB will identify the condition as a tray error and will indicate an error code on the copier's display.

Sensor	Notation	Connector
Tray B lower limit sensor	PI24	J109-3
Tray B locked sensor	PI23	J110B-10
Tray B paper sensor	PI22	J110B-7
Tray B up position sensor	PI20	J110B-4
Tray B down position sensor	PI21	J110A-3

Table 2-601

Function	Motor	Notation
Moves up tray B.	Tray B lifter motor	M12

Table 2-602

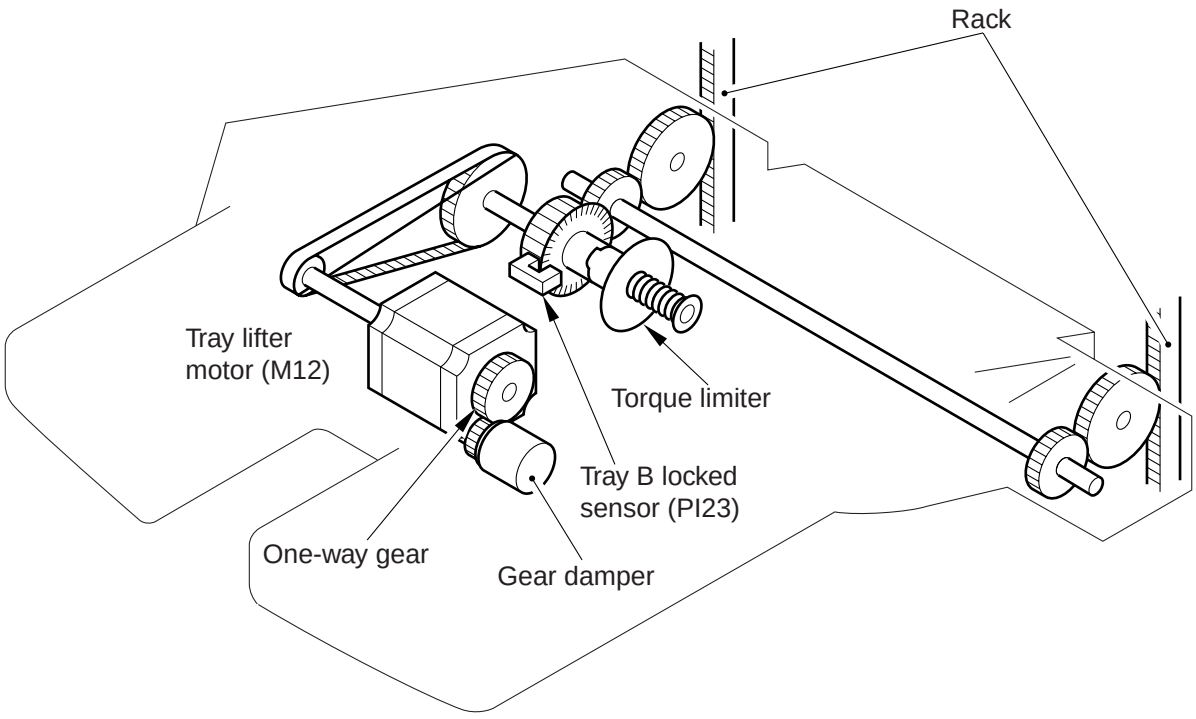

Figure 2-601

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2. Detecting the Surface of Paper on the Tray

The tray B paper sensor used to detect the surface of paper on the tray consists of two sensors: one serving as a light-emitting unit and the other, light-receiving unit.

The light-receiving side possesses three cells:

The bottom light-receiving cell is used when no paper exists on the tray. The output of the upper two cells changes if either is locked by paper on the tray. By referring to either of the two light-receiving cells, the machine will be able to identify the presence of paper even its trailing edge curls upward.

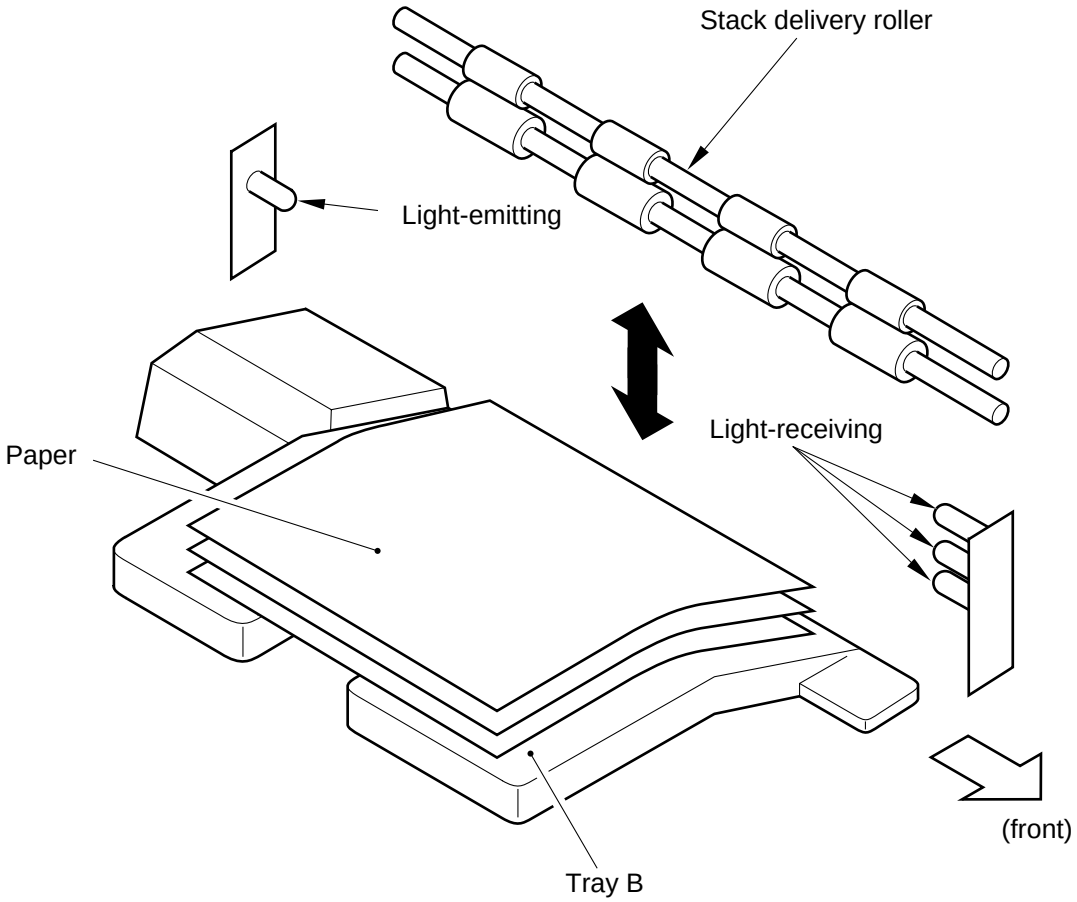

Figure 2-602

3. Identifying the Position of Tray B

The machine is equipped with the following sensors to identify the position of tray B: the rack is equipped with tray B lower limit sensor (PI24; fixed), and the inside the tray is equipped with tray B up position sensor (PI29) and tray B down position sensor (PI21). See Tables 2-603 and -604 for how positions are identified.

Notation	Name	Position
PI24	Tray B lower limit sensor	1000-sheet stacking position (large-size paper stacking lower limit)

Table 2-603

Notation	PI20	PI21	-
Name	Tray B up position sensor	Tray B down position sensor	
Sensor state	ON	OFF	About 10 mm above stacking start position
	ON	ON	2000-sheet stacking position

Table 2-604

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4. Controlling Tray B Lifter Motor

Figure 2-603 is a block diagram showing how tray B lifter motor (M12) is driven. The tray B lifter motor is a 4-phase stepping motor. The motor is turned on and off and the direction of its rotation is changed by switching between pulse signals A, B, A*and B* and by changing the output timing of four pulse signals. To hold the motor, the level of STTRYMHLD is switched to a hold level.

The finisher controller monitors the state of tray B locked sensor (PI23) when pulse signals are generated. The finisher controller PCB assumes that the motor rotation is normal if the sensor repeats turning on and off at specific intervals while pulses are being generated. Otherwise, it will identify an error in the motor or the drive mechanism, and will indicate an error code on the copier's control panel.

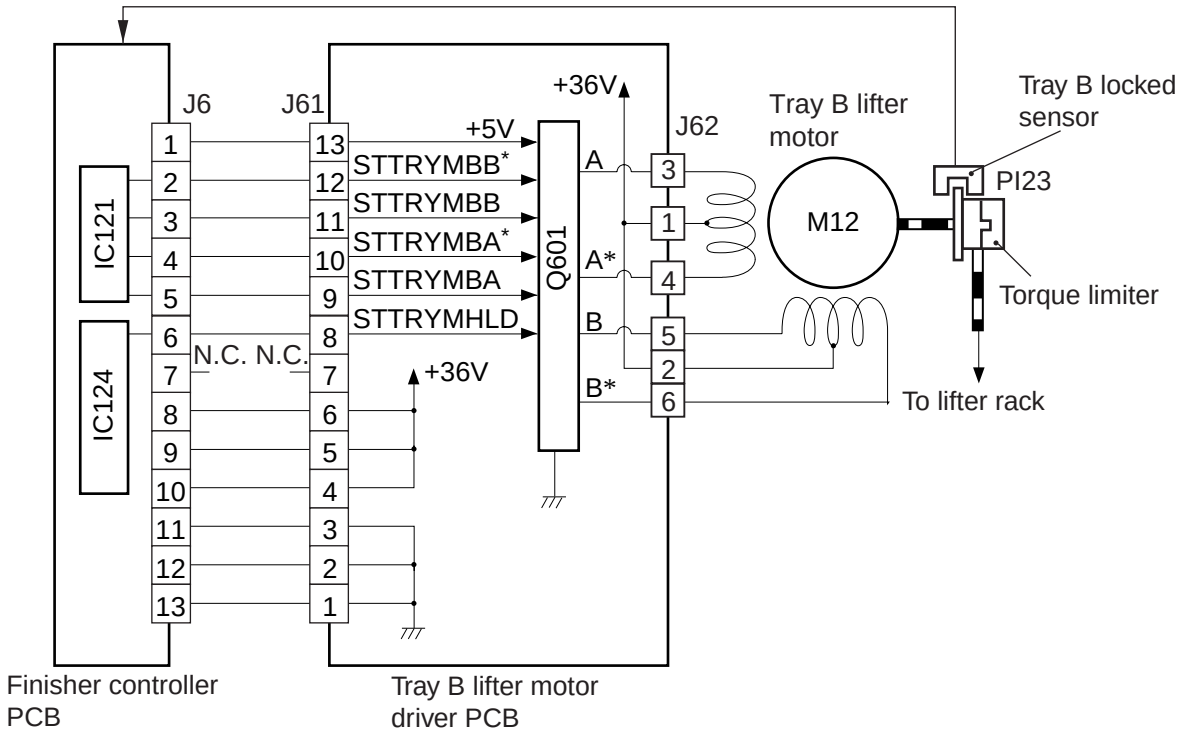

Figure 2-603

VII . FANS

1. Outline

The machine is equipped with a power supply fan (FM1) for cooling the switching regulator. The fan starts to rotate when the drive signal (FANON) from the finisher controller PCB goes '0'. While in rotation, the fan sends the FANSTP signal to the finisher controller PCB; otherwise, the signal will go '1', causing the finisher controller PCB to assume that the fan has stopped and indicate an error code on the copier's control panel.

Figure 2-702 shows the location of the fan and the flow of the air; Figure 2-701, on the other hand, shows the timing at which the fan turns on.

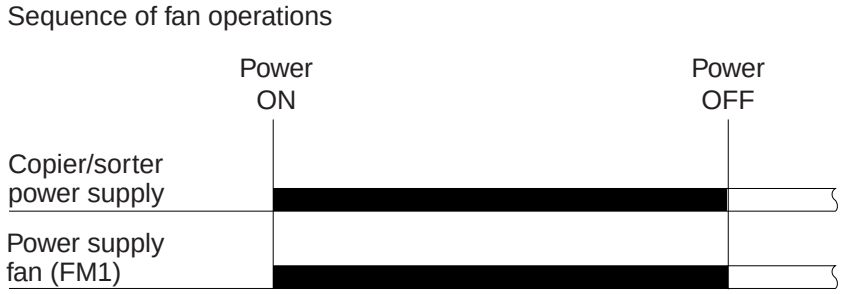

Figure 2-701

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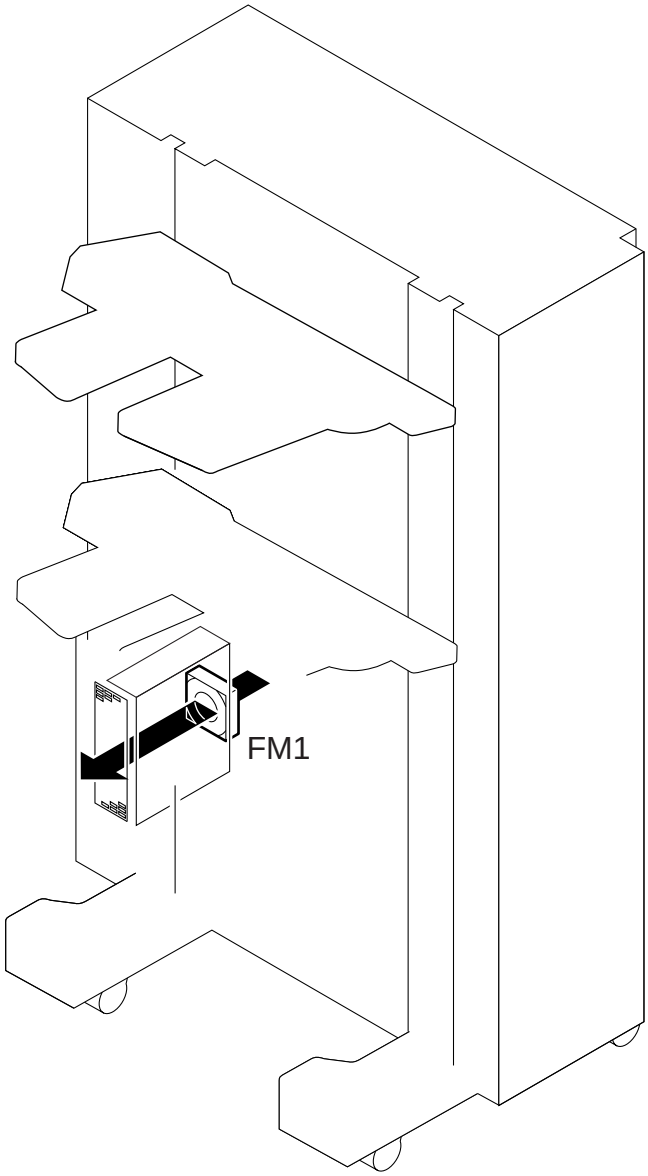

Figure 2-702

Notation	Name	Air	Filter	Remarks
FM1	Power supply	Blowing	None	Cools the switching regulator.

Table 2-701

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VIII . POWER SUPPLY

1. AC Power Supply

AC power comes from an external power supply through the machine's AC fuse PCB to reach the switching regulator (SWR1). The switching regulator is turned on and off by the drive signal (REMTSWH) from the copier. Upon activation, the switching regulator supplies the fuse PCB with 36, 24, and 5 V DC power.

2. DC Power Supply

The 36, 24, and 5 V power supplies are sent to the finisher controller PCB by way of the fuse PCB (PCB6).

The 24 VF power supply is sent directly to the power supply fan (FM1) by the fuse PCB.

a. 36 V Power Supply

It is sent to the finisher controller PCB from the switching regulator to the finisher controller PCB through two microswitches.

Notation	Switch
MSW6	Tray safety switch (front)
MSW7	Tray safety switch (rear)

Table 2-801

b. 24 V Power Supply

The supply (24 VSTP) to the stapler motor (M11) and staple shift motor (M12) is sent to the finisher controller PCB by the switching regulator through the following four microswitches:

Notation	Switch
MSW1	Front cover switch
MSW8	Stapling safety switch (rear)
MSW2	Swing guide safety switch
MSW9	Stapling safety switch (front)

Table 2-802

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The supplies to the inlet motor (M1), buffer, motor (M2), and stapler shift motor (M10) are sent to the finisher controller PCB by way of the front cover switch (MSW1) in the form of 24 VZDR; the other supplies are sent directly from the switching regulator.

c. 5 V Power Supply

It is sent directly by the switching regulator.

Reference:

The output accuracy of each DC power supply is as follows:
36 V: +11%, -5.5%
24 V: ±5%
5 V: 5.2 ±5%
The above applies when the AC input is 85 to 132 V (100/115V area) or 187 to 264 V (230V area).

3. Protective Functions

a. AC Fuse PCB

The AC fuse PCB is equipped with two fuses (FU731, FU733) which cut off the circuit in response to an overcurrent. The PCB is also provided with a spare fuse (FU732).

b. Switching Regulator

The switching regulator is equipped with a fuse (F001) which cuts off the circuit in response to an overcurrent.

c. Fuse PCB

The fuse PCB is equipped with the fuses shown in Table 2-803 which blow in response to an overcurrent; note that these fuses cannot be replaced in the field:

Power supply	Fuse
24VU	FU711
24VR	FU714,FU717
24VSTP	FU714
24VF	FU718
5V	FU716

Table 2-803

d. Finisher Controller PCB

The supply to the sort tray motor (M12) is equipped with a fuse (FU104) which blows in response to an overcurrent.

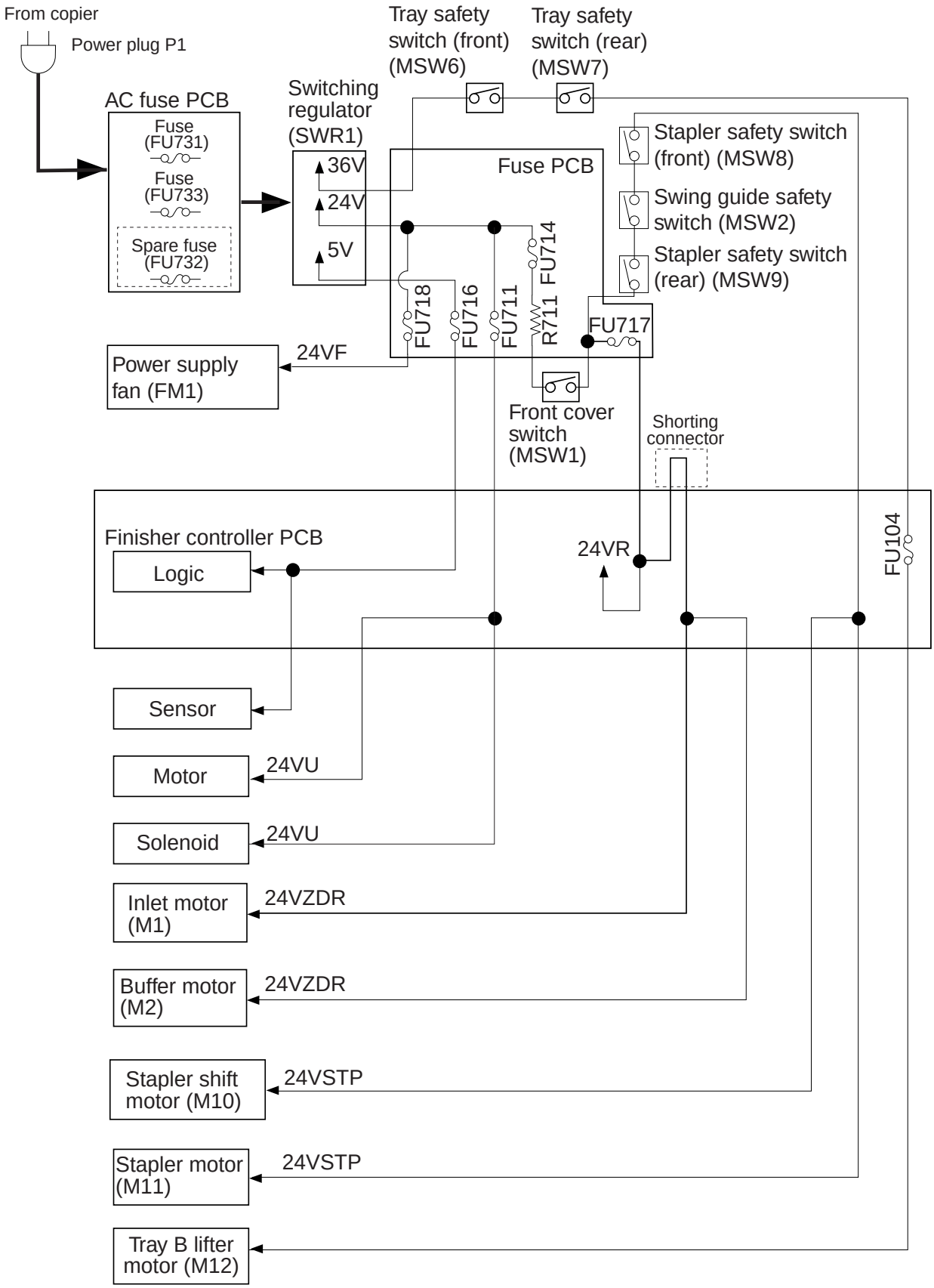

Figure 2-801

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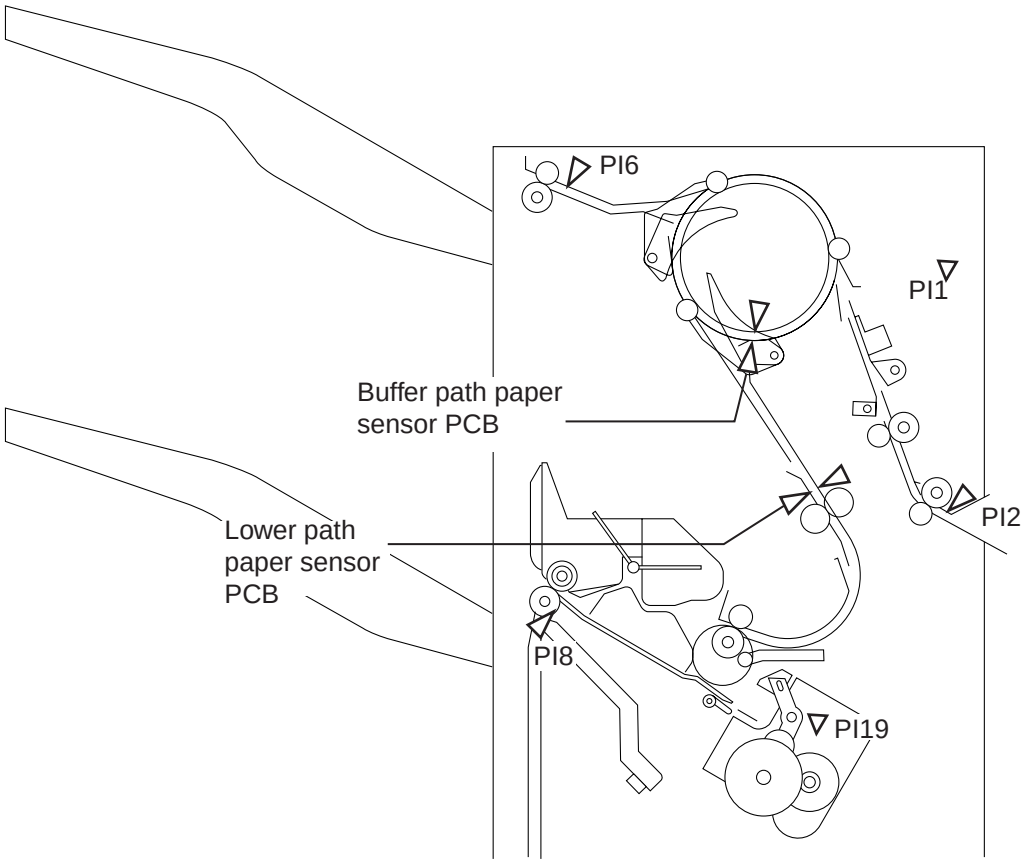
IX. DETECTING JAMS

1. Outline

The machine checks for jams at such times as programmed in the ROM of the DC controller PCB, and detects a jam in relation to the presence/absence of paper at a specific sensor.

When a jam is detected, the DC controller PCB communicates the nature of the jam to the copier in the form of a code. (The code may be checked in the copier's service mode, or by referring to LED101 on the finisher DC controller PCB.)



PI1: Front door open sensor
PI2: Inlet path sensor
PI6: Non-sort delivery sensor
(S2): Buffer path paper sensor PCB
(S3): Lower path paper sensor PCB
PI8: Stack delivery sensor
PI19: Stapling home position sensor

Figure 2-901

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Jam	Sensor	Description	Code
Inlet delay	PI2	The input path sensor did not turn on a specific time after the copier had generated the delivery signal.	16
Inlet stationary	PI2	The paper did not move past the sensor when it was fed a specific length (paper length + 100 mm) after the sensor had detected it.	26
Buffer path delay	Buffer path paper sensor	The buffer path paper sensor did not detect the paper when it was fed a specific length (438 + 150 mm) after the inlet path sensor had turned on.	17
Buffer path stationary	Buffer path paper sensor	The paper did not move past the sensor when it was fed a specific length (paper length + 100 mm) after the sensor had detected it.	27
Non-sort delay	PI6	The non-sort delivery sensor did not detect the paper when it was fed a specific length (348 + 150 mm) after the inlet path sensor had turned on.	18
Non-sort stationary	PI6	The paper did not move past the sensor when it was fed a specific length (paper length + 100 mm) after the inlet path sensor had turned on.	28
Lower path delay	Lower path paper sensor (S3)	The lower path paper sensor did not detect the paper when it was fed a specific length (540 + 150 mm) after the inlet path sensor had turned on.	19
Lower path stationary	Lower path paper sensor (S3)	The paper did not move past the sensor when it was fed a specific length (paper length + 100 mm) after the sensor had detected it.	29
Door open	PI1	The front door was opened during feeding operation.	08
Power-on	PI2, PI6, buffer path paper sensor (S2), lower path lower sensor (S3)	Either of the sensors indicated on the left detected paper when power was turned.	07
Staple	PI19	When the stapler motor was rotated clockwise, the sensor did not turn on 0.5 sec after it had turned off; in addition, the sensor turned on within 0.5 sec when the staple motor was rotated counterclockwise. (If the sensor remains off 0.5 sec after the motor was rotated counterclockwise, an error will be identified.)	06

Table 2-901

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CHAPTER 3

MECHANICAL SYSTEM

The mechanical characteristics of the finisher are discussed in the following pages; go through the instructions given when disassembling/assembling the finisher's parts while keeping the following in mind:

1. ⚠ Disconnect the power plug before disassembly/assembly work.
2. Assemble the parts by reversing the steps used to disassemble them, unless otherwise noted.
3. Identify the screws by type (length, diameter) and location.
4. Do not leave out the washer that comes with the screw used for the grounding wire and the varistor to ensure electrical continuity.
5. Do not operate the machine with any of its parts removed, unless otherwise mentioned.

I. EXTERNALS AND CONTROLS 3-1
II. PROCESSING TRAY UNIT 3-13
III. TRAY B UNIT 3-21
IV. KNURLED BELT RELEASING UNIT 3-28
V. KNURLED BELT 3-30
VI. BUFFER ROLLER UNIT 3-31
VII. STAPLER UNIT 3-35
VIII. PCBs 3-42

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I . EXTERNALS AND CONTROLS

A. External Covers

Remove the covers as necessary when cleaning, inspecting, or repairing the inside of the machine.

Those covers that may be detached by merely removing the mounting screws are omitted from the discussions.

[1] Rear cover (6)
[2] Upper rear cover (2)
[3] Tray A (0)
[4] Stacking wall (upper; 4)
[5] Stacking wall (lower; 4)
[6] Foot cover (front; 2)
[7] Foot cover (rear; 2)
[8] Upper cover unit
[9] Tray B (4)

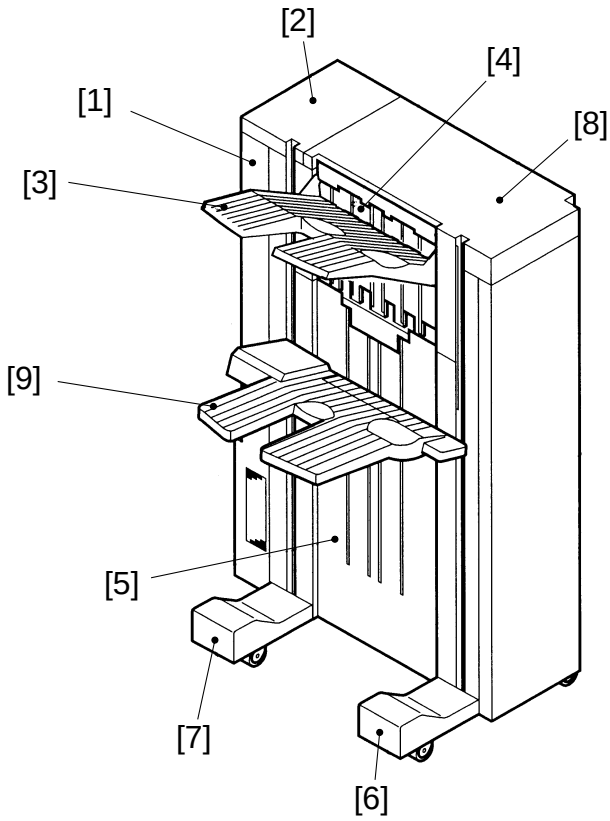

Figure 3-101

[1] Support cover (1)
[2] Inside cover (4)
[3] Inside lower cover (2)
[4] Buffer roller knob (0)
[5] Stopper (1)

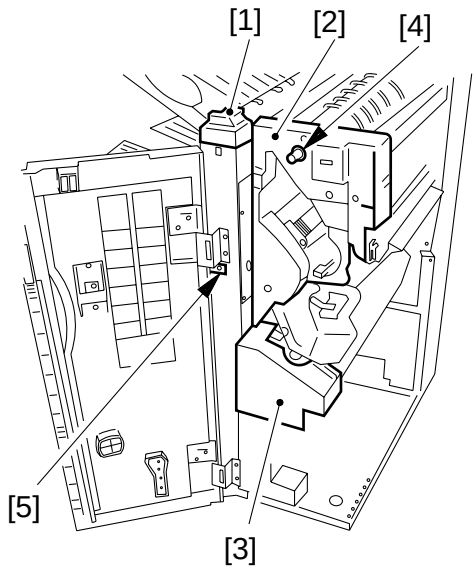

Figure 3-102

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[1] PCB cover (1)

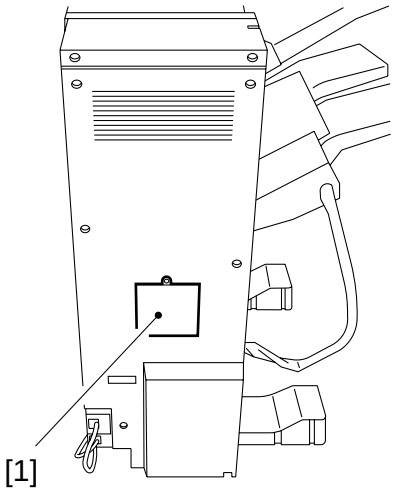

Figure 3-103

B. Removing the Upper Cover Unit

1) Remove two screws, and remove the upper rear cover.
2) Remove the two screws [1] from the side plate.

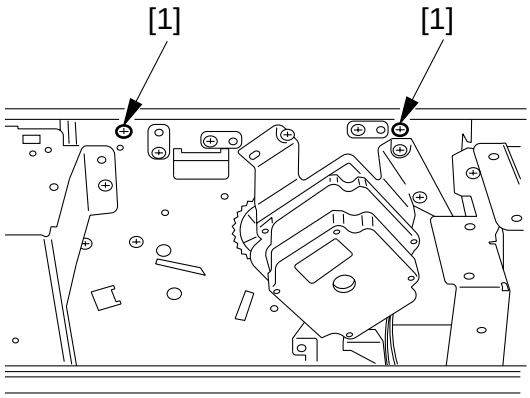

Figure 3-104

3) Remove the screw [2], and detach the upper cover unit [3].

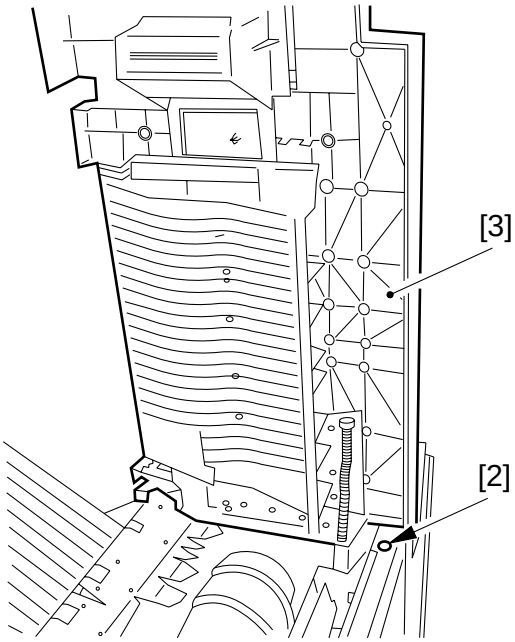

Figure 3-105

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C. Releasing from the Copier

1) Remove the buffer roller knob, and detach the inside cover.
2) Remove the upper cover.
3) Remove the two screws [2], and detach the latch fixing plate (front) [1].

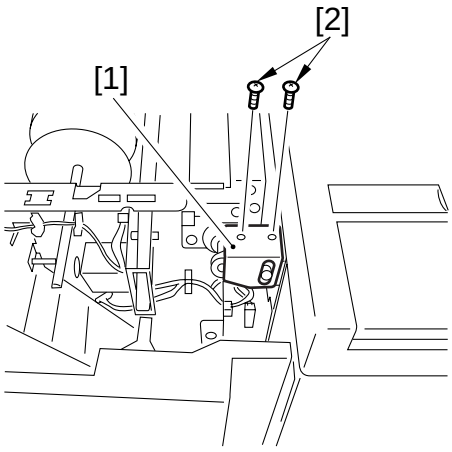

Figure 3-106

4) Shift up the latch claw (front) [3].

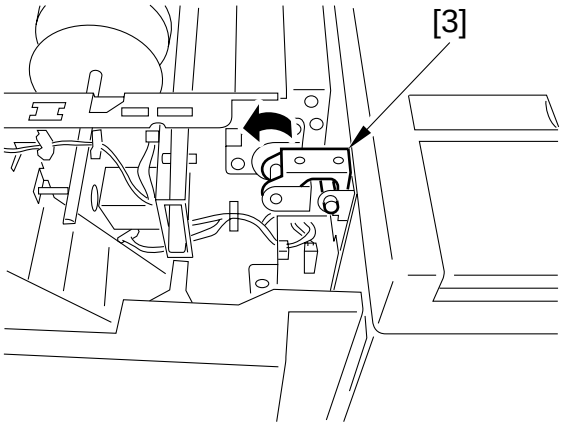

Figure 3-107

5) Remove the two screws [5], and detach the latch fixing plate (rear) [4].

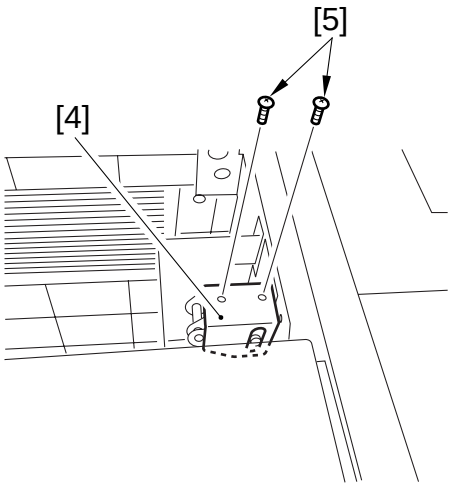

Figure 3-108

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6) Shift up the latch claw (rear) [6].

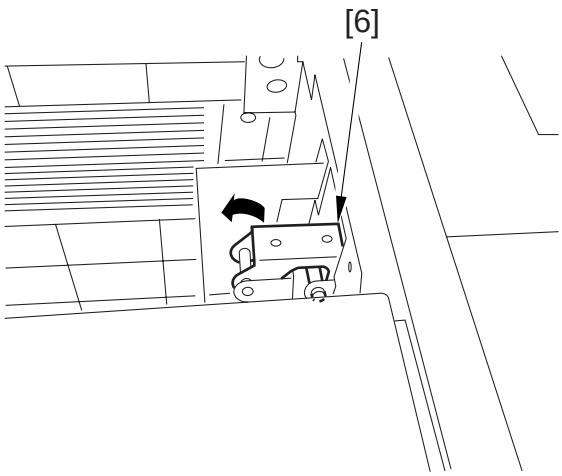

Figure 3-109

7) Release the finisher from the copier.

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D. Adjusting the Height

You may have to adjust the height of the machine to ensure that it will remain aligned with its host copier. As necessary, perform the following:

D.1 Checking the Height

1) Compare the top of the upper cover of the machine and the top of the upper cover of the copier. If the difference in height is not as indicated in Figures 3-112 and -113, make adjustments. (Also, if jams occur frequently at the inlet to the finisher, make a check to see if the height is the cause.)
The height of the machine may be changed by adjusting the height of the casters shown in Figure 3-110.

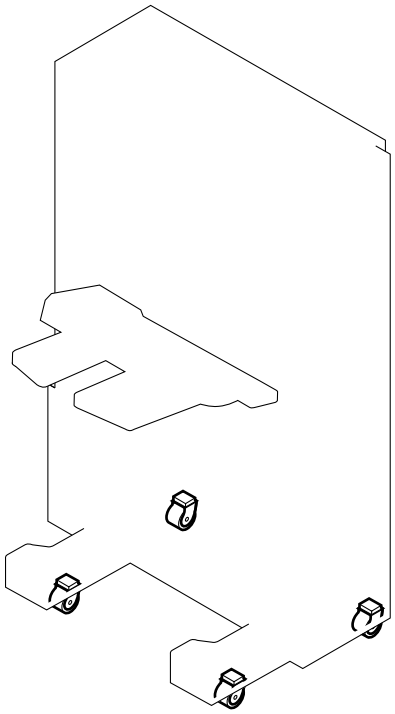

Figure 3-110

2) When adjusting the rear left caster, remove the connector cover [1] (one screw [2]).

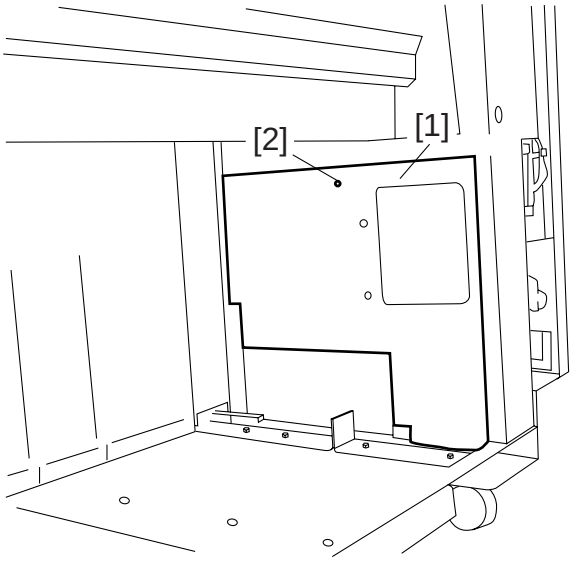

Figure 3-111

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a. If the top of the copier's left cover is higher,
→within 3 mm
Otherwise, perform the steps under D.2.

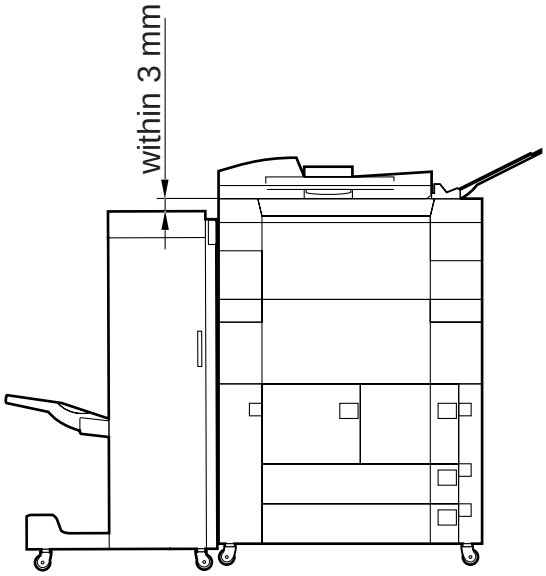

Figure 3-112

b. If the top of the upper cover of the machine is higher,
→within 2 mm
Otherwise, perform D.3.

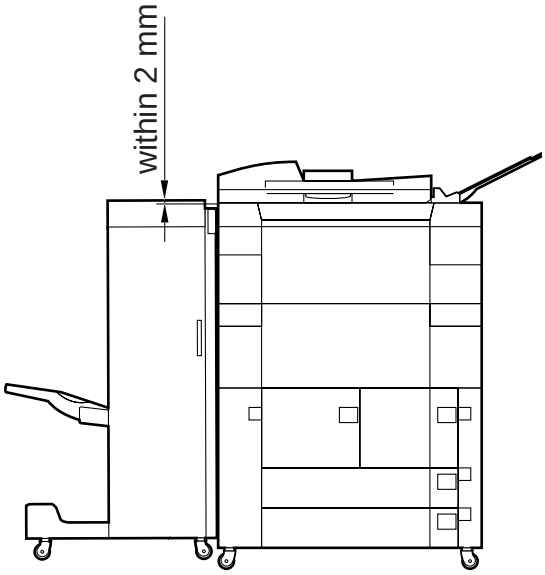

Figure 3-113

2) Open the front cover. Remove the screw [2], and detach the spanner [1] from behind the front cover.

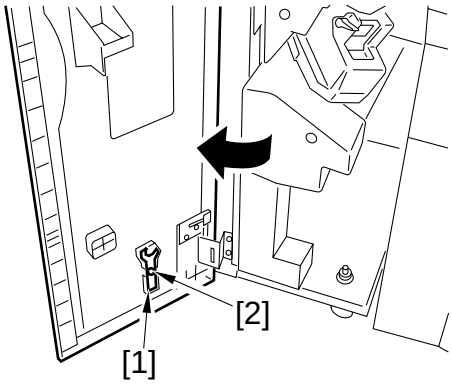

Figure 3-114

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3) Remove the two screws each [4], and detach the foot cover (front, rear) [3].
4) Release the machine from the copier. (See I.C.)

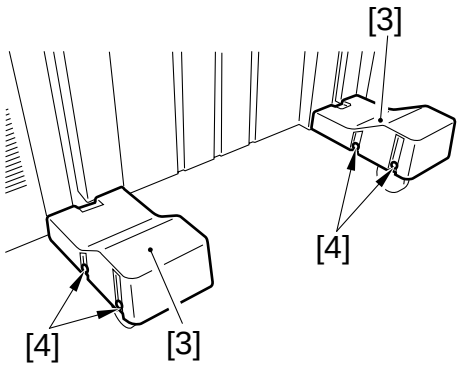

Figure 3-115

D.2 If the copier is higher,

1) Loosen the fixing nut by turning it in the direction of arrow C. Turn the caster adjusting foot in the direction of arrow D. A full turn of the foot will change the height by about 1.75 mm. Turn the foot as many time as necessary. Perform this for the four feet.

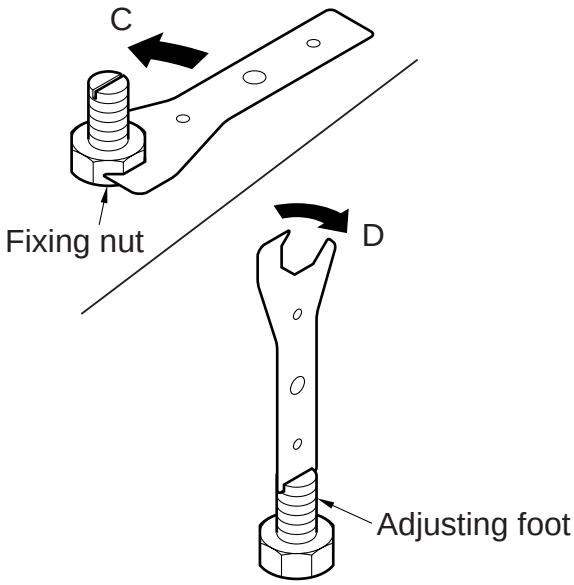

Figure 3-116

D.3 If the machine is higher,

1) Loosen the fixing nut by turning it in the direction of arrow C. Turn the caster adjusting foot in the direction of E. A full turn of the adjusting foot will change the height by about 1.75 mm. Turn the foot as many times as necessary. Perform this for the four feet.

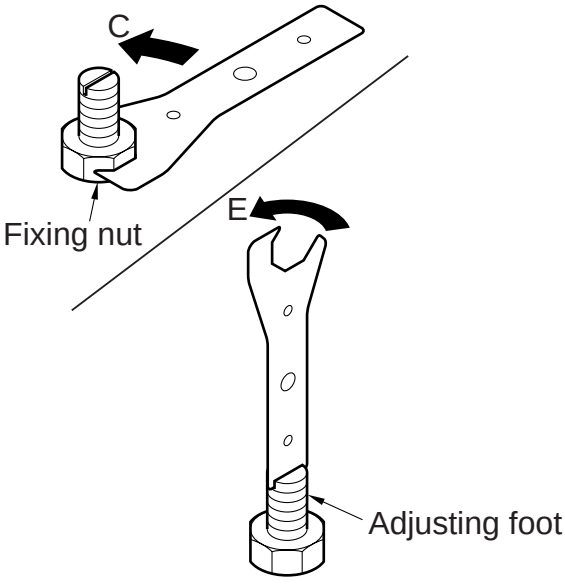

Figure 3-117

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D.4 Checking the Height

1) Connect the machine to the copier, and check the height. If the height is not appropriate, make adjustments once again. If appropriate, tighten all fixing nuts, and attach the foot covers (front, rear).

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E. Removing the Slope

You may have to remove the tilt caused by floor conditions by performing the following; be sure to adjust the height before performing the steps:

E.1 Checking the Tilt

1) Check to find out in which direction the machine tilts.
   - The gap between the machine and the copier must be 5 +0, -3 mm. If the gap is wider, identify the condition as tilt A, and perform the steps under E.2; if the gap is narrower, on the other hand, identify the condition as tilt B, and perform the steps under E.3.

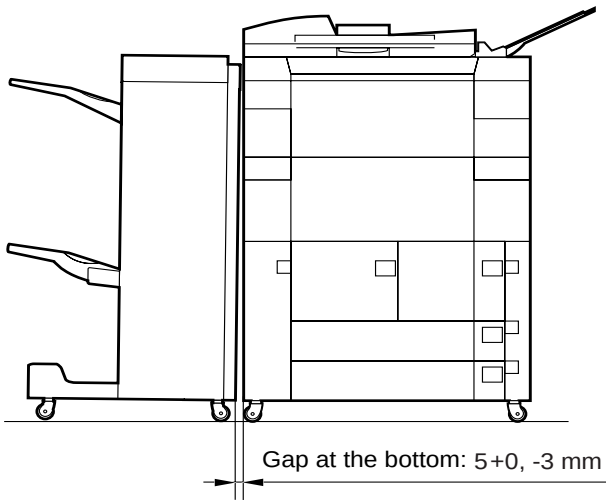

Figure 3-118

Reference:

To correct the tilt, turn the two casters shown in Figure 3-119.

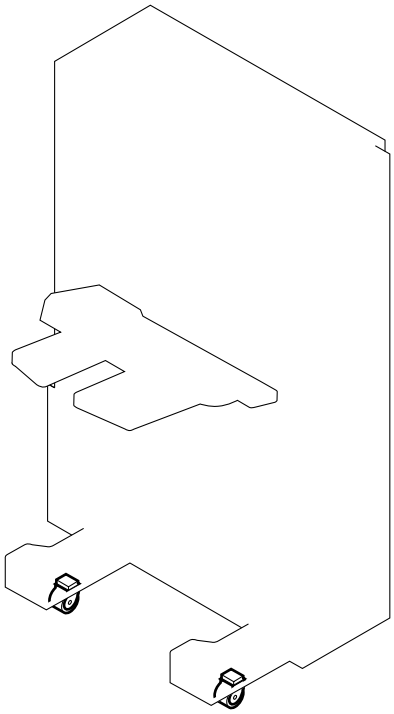

Figure 3-119

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2) Open the front cover. Remove the screw [2], and detach the spanner [1] from behind the front cover.

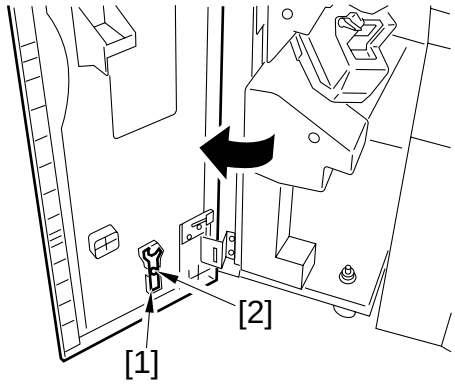

Figure 3-120

3) Remove the two screws each [4], and detach the foot cover (front, rear) [3].

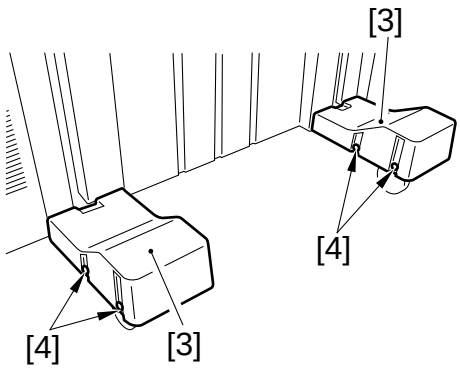

Figure 3-121

E.2 Correcting Tilt A

1) Loosen the fixing nut by turning it in the direction of arrow C. Turn the adjusting foot of the caster in the direction of arrow D several times. Perform this for both front and rear feet.

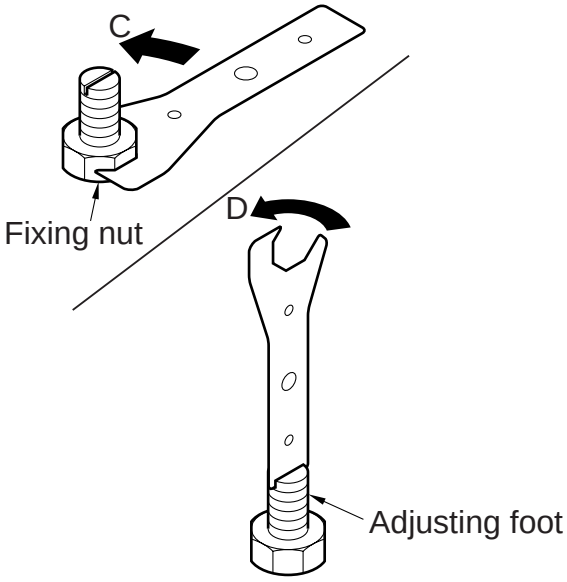

Figure 3-122

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2) Check the gap between the machine and the copier. If the gap is still large, turn the adjusting foot further. If done in excess, on the other hand, turn the adjusting foot back. Perform this for both front and rear feet.
3) When the gap is appropriate, tighten the fixing nuts (front, rear).
4) Mount the foot covers (front, rear).
5) Attach the spanner.

E.3 Correcting Tilt B

1) Loosen the fixing nut by turning it in the direction of arrow C. Turn the adjusting foot of the caster in the direction of arrow E. Perform this on both front and rear feet.

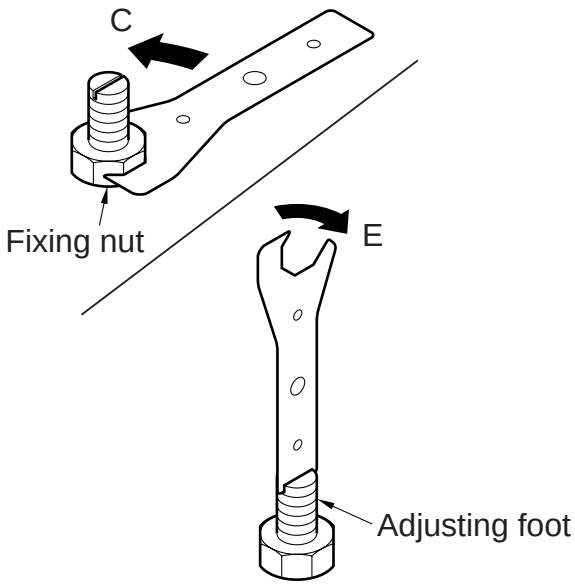

Figure 3-123

2) Check the gap between the machine and the copier. If the gap is still narrow, turn the adjusting foot further. If done in excess, on the other hand, turn the adjusting foot back. Perform this on both front and rear feet.
3) When the gap is appropriate, tighten the fixing nuts (front, rear).
4) Mount the foot covers (front, rear).
5) Attach the spanner.

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F. Points to Note When Handling the Stacking Wall Rails

Take care not to cause scratches or dents on the stacking wall rails [1]. Scratches or dents can adversely affect stacking performance.

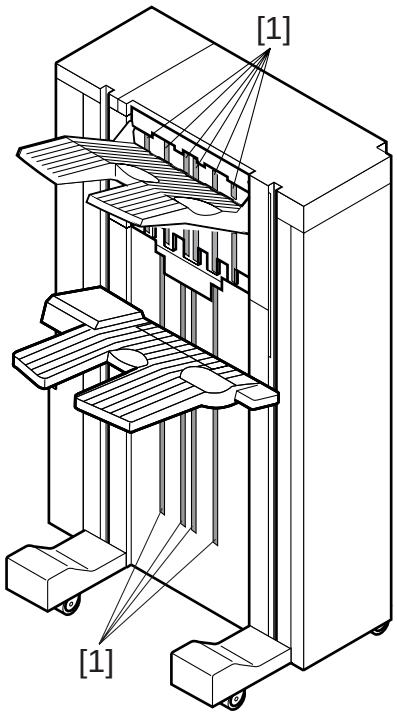

Figure 3-124

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II . PROCESSING TRAY UNIT

A. Removing the Processing Tray Unit

1) Remove tray A.
2) Remove the stacking wall (upper).
3) Remove the screw, and remove the tray B stopper.
4) Move up tray B as far as it goes by hand. (See the descriptions on the upward movement of tray B.)
5) Remove the four screws, and detach the stacking wall (lower).
6) Disconnect the screw [2], and detach the connector cover [1].

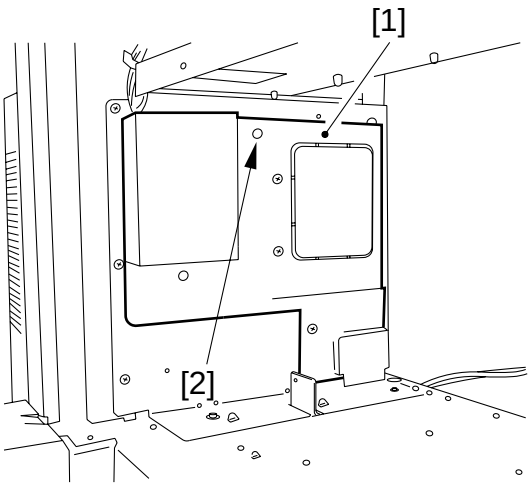

Figure 3-201

7) Disconnect the seven connectors [3], and free the harness [4] from the cord clamp.

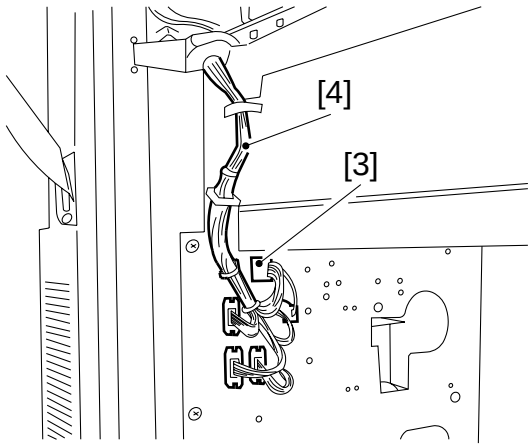

Figure 3-202

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8) Remove the four screws [5], and detach the processing tray unit [6].

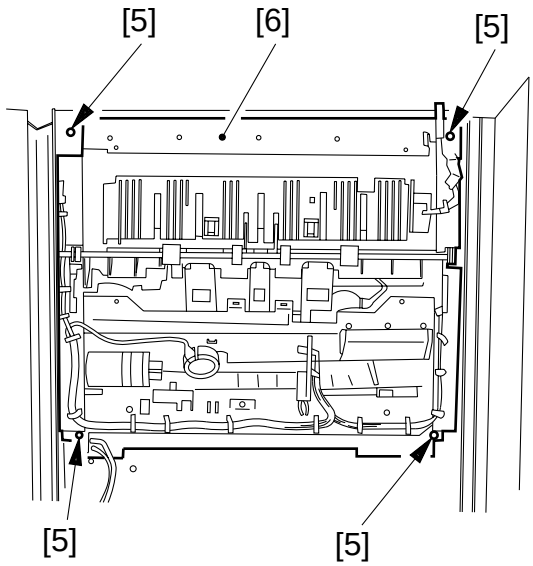

Figure 3-203

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B. Removing the Paddle Unit

1) While lifting the swing guide, remove the screw [1]; then, detach the paddle unit [2].

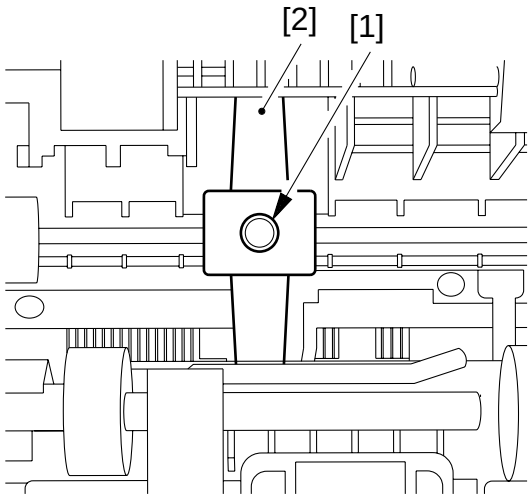

Figure 3-204

Reference:

After removing the processing tray, you may detach the paddle unit from behind the processing tray unit.

C. Removing the Paddle

1) Remove the paddle unit. (See II.B "Removing the Paddle Unit.")
2) Remove the retaining roll [1], and detach the paddle.

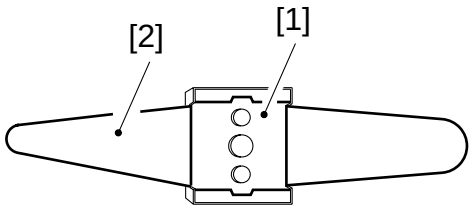

Figure 3-205

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D. Removing the Processing Tray

1) Remove the processing tray unit. (See II.A.)
2) Remove the screw [1] from under the stack delivery roller.

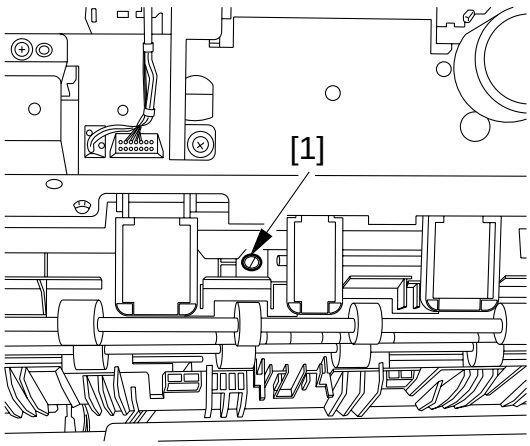

Figure 3-206

3) Remove the screw [2] from the processing tray.

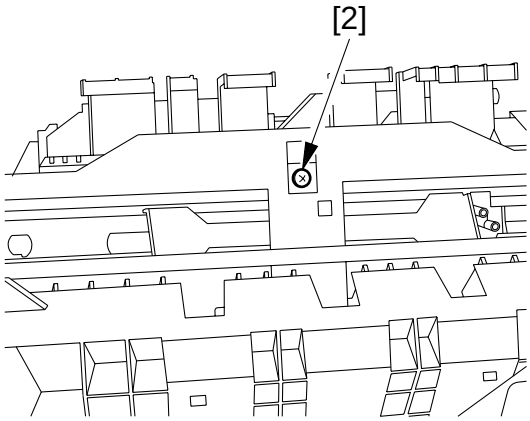

Figure 3-207

4) Slide the processing tray [3] in the direction of arrow A, and detach it into the direction of arrow B.

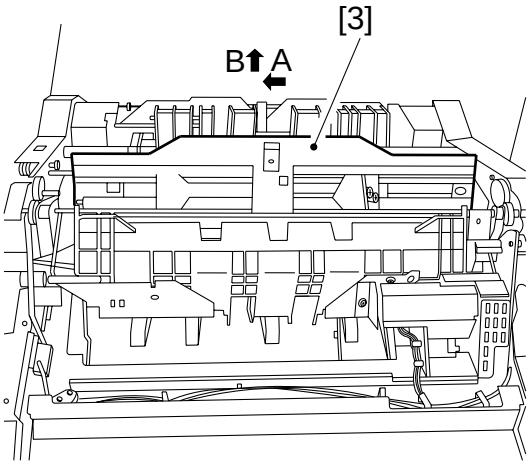

Figure 3-208

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E. Removing the Jogging Motor

Reference:

The figures show the removal of the front jogging motor. The rear jogging motor may be removed in the same way.

1) Remove the processing tray unit (II.A); at the same time, remove the processing tray (II.D).
2) Turn the tray auxiliary plate motor [1] by hand, and move the tray auxiliary plate from the home position.

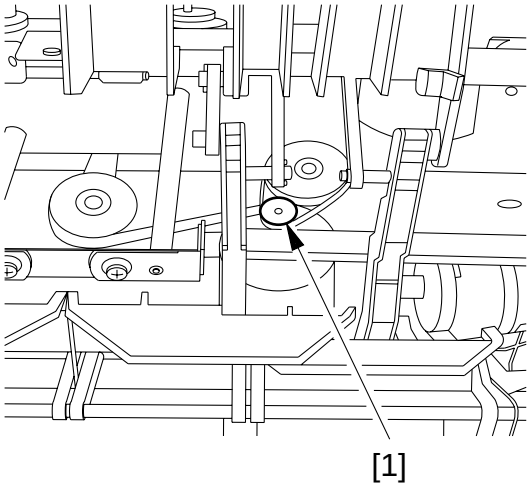

Figure 3-209

3) Remove the screw [3], and detach the motor cover [2].

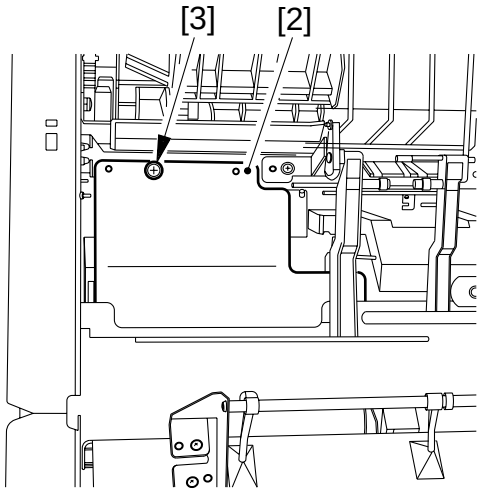

Figure 3-210

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4) Loosen the screw [4], and loosen the belt tensioner.

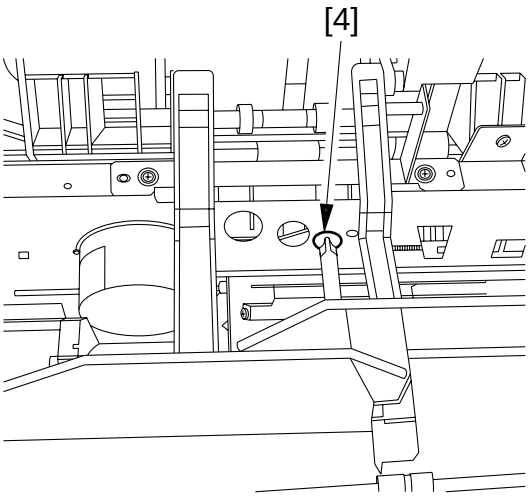

Figure 3-211

5) Disconnect the connector [5].

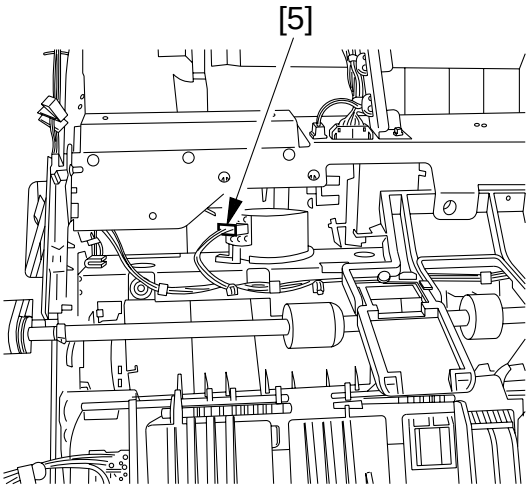

Figure 3-212

6) Remove the two screws [6], and detach the jogging motor [7].

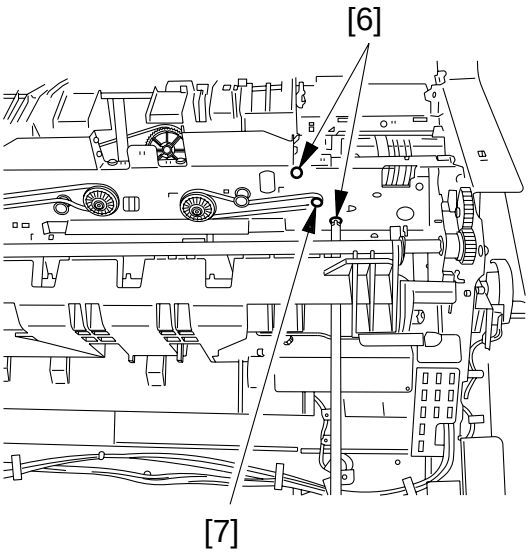

Figure 3-213

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Caution:
When mounting the motor cover [2], be sure that the lower edge of the cartridge will not be above the stay. Otherwise, the cover and the stapler will interfere.

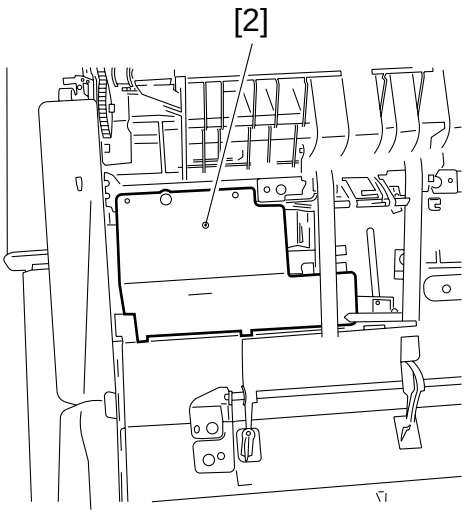

Figure 3-214

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III . TRAY B UNIT

A. Removing the Tray B Unit

1) Remove tray A.
2) Open the front cover and the upper cover; then, remove the screw, and detach the stopper.
3) Remove the screw, and detach the support cover.
4) Remove the upper rear cover and the rear cover.
5) Disconnect the connector [1], and the grounding wire [2]; then, free the harness from the cord clamp [3].

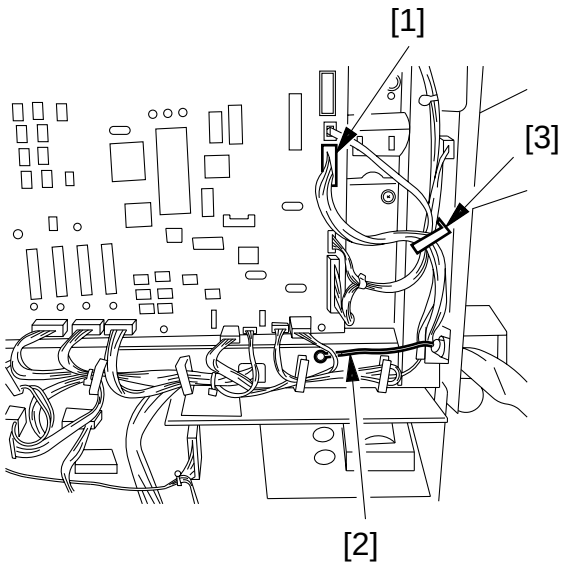

Figure 3-301

6) Remove the two screws, and detach the harness holder [4].

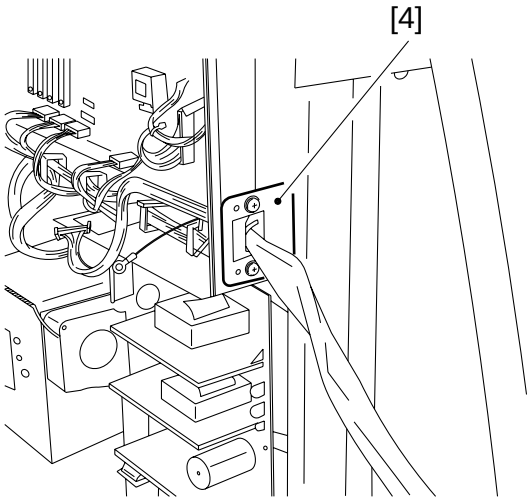

Figure 3-302

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7) Lift the tray B unit [5] to remove.

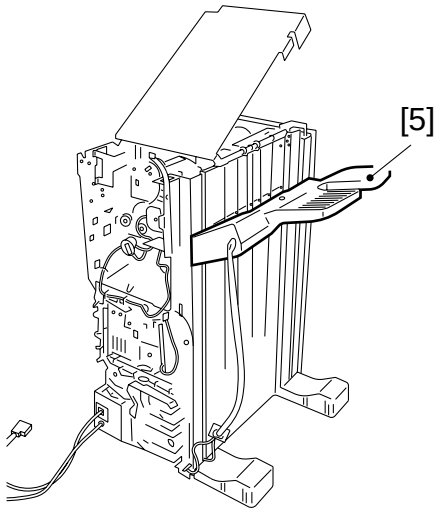

Figure 3-303

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B. Moving Down the Tray B UNIT

1) Remove tray B (four screws).
2) While holding down the frame of the tray [1], release the clutch [2] with a screwdriver.

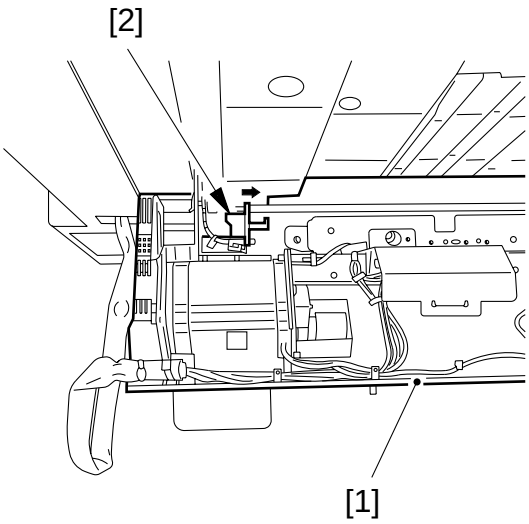

Figure 3-304

3) While keeping the clutch released, move down the tray B unit.

Reference:

You may insert a screwdriver through the long hole [3] in the back of the tray B unit frame to release the clutch.

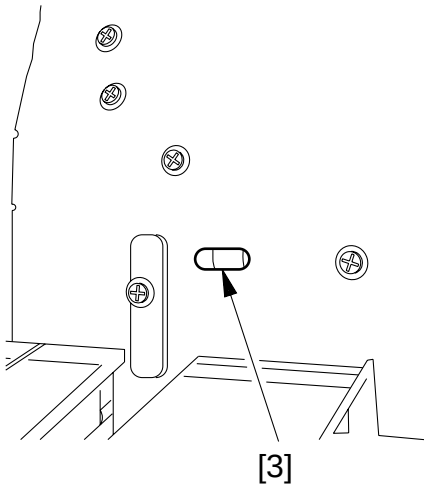

Figure 3-305

C. Removing the Tray B Lift Motor (M12)

1) Remove tray B (four screws).
2) Move down the tray B unit as far as it goes (III.B). Otherwise, the tray can drop when the motor is removed.
3) Remove the screw, and detach the motor driver PCB cover [1].

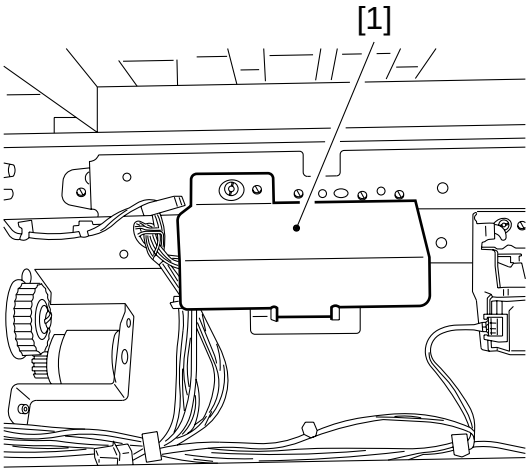

Figure 3-306

4) Disconnect the connector (J602) [2], and free the harness from the cord clamp [3].

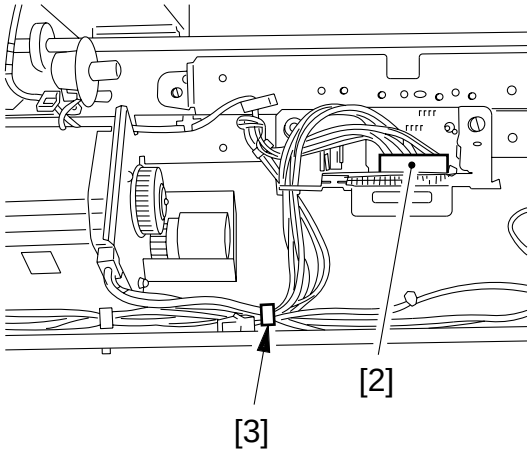

Figure 3-307

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5) Remove the four screws [4], and detach the motor [5].

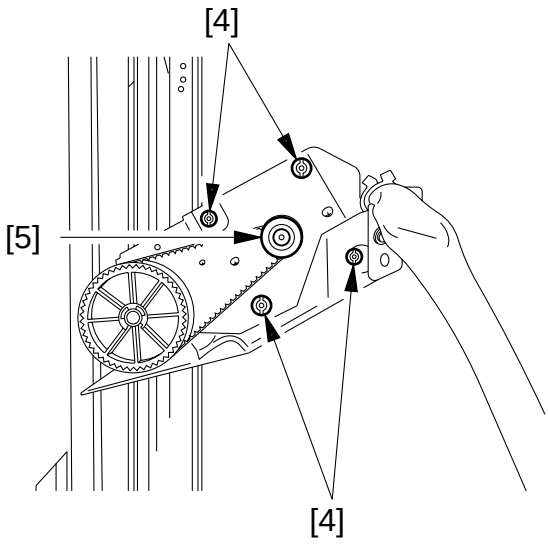

Figure 3-308

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D. Mounting the Tray B Lift Motor (M12)

1) Mount the motor so that the circle drawn connecting the bosses [1] on the motor will fit the large, round hole [2] on the mounting face.

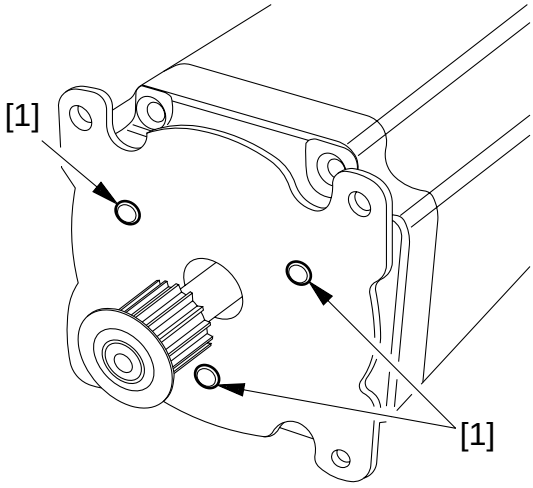

Figure 3-309

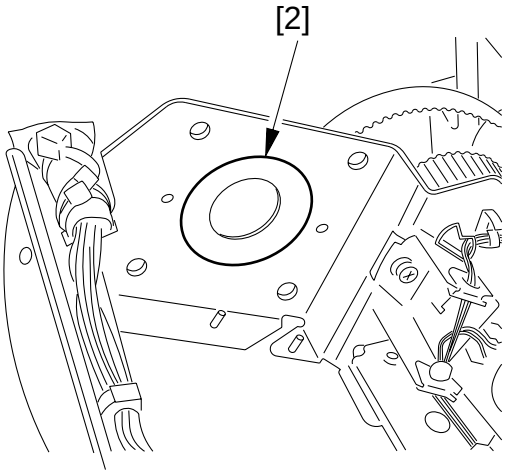

Figure 3-310

Reference:

You can check to see if the bosses are fitted in the large, round hole in reference to the small holes [3] on the side of the drive belt.

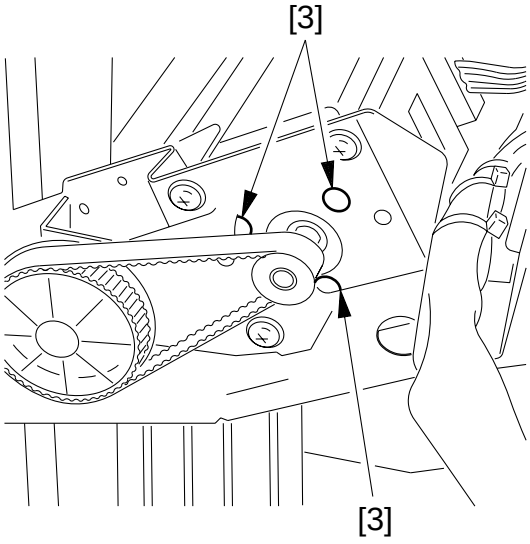

Figure 3-311

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E. Position of Tray B at Power-On

At power-on, the tray B [1] must not be above the tray B paper sensor [2]. Otherwise, an error will occur when the position of the tray B is detected.

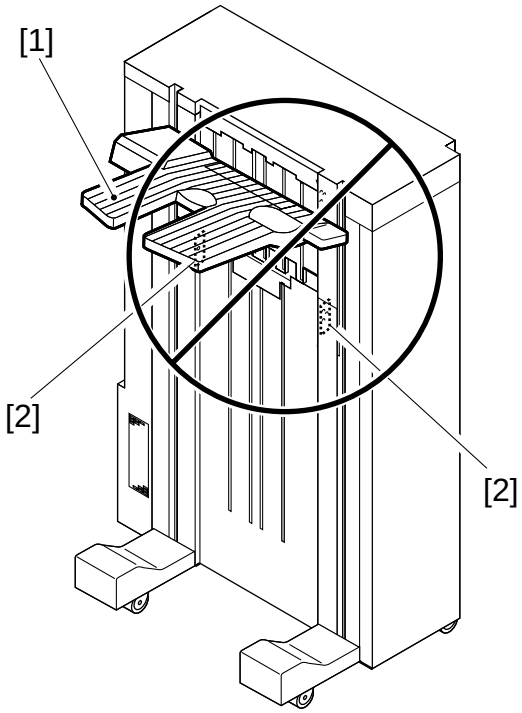

Figure 3-312

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IV . KNURLED BELT RELEASING UNIT

A. Releasing the Knurled Belt Releasing Unit

1) Release the machine from the copier.
2) Disconnect J19 [1] and J18 [2].

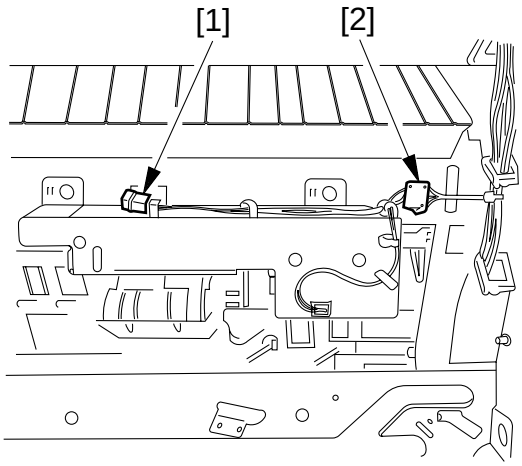

Figure 3-401

3) Remove the three screws [3].

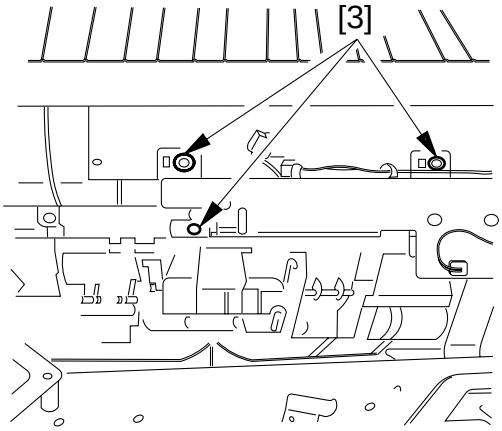

Figure 3-402

4) While detaching the knurled belt [4] from the pulley, detach the knurled belt releasing unit.

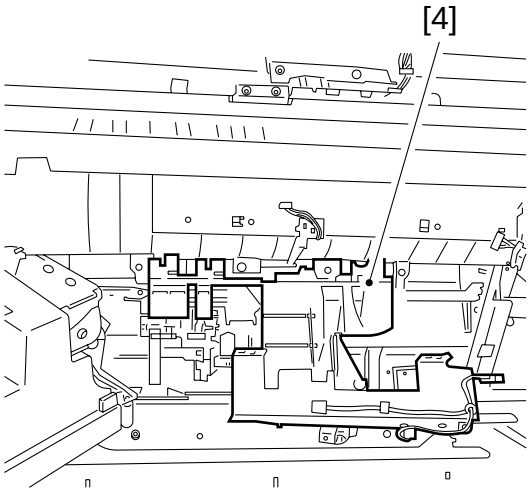

Figure 3-403

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B. Adjusting the Position of the Knurled Belt Releasing Solenoid (SL3)

1) Loosen the screws [1].
2) Slide the solenoid [2] so that the distance A of the solenoid is 2.5 ± 0.2 mm; then, tighten the screws.

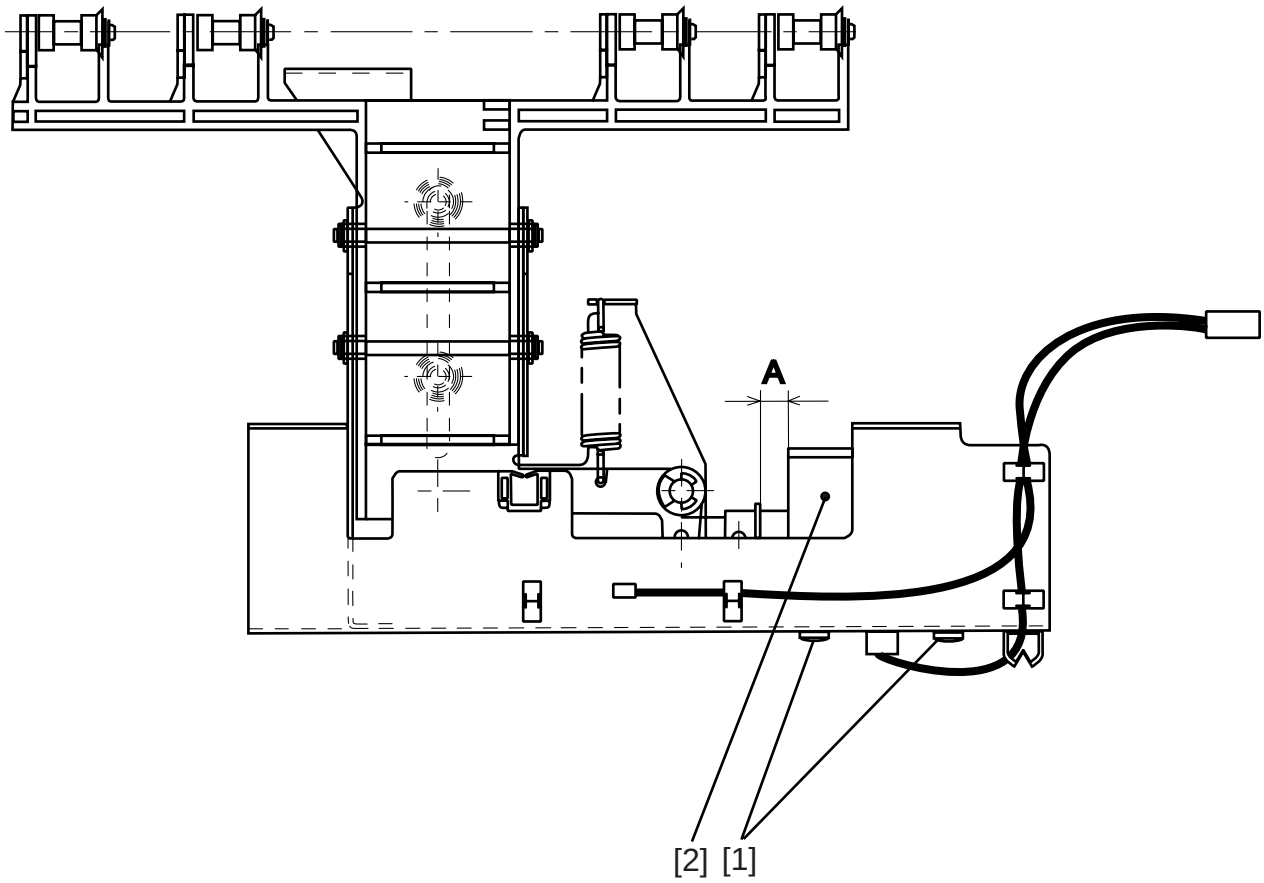

Figure 3-404

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V . KNURLED BELT

A. Removing the Knurled Belt

1) Remove the processing tray unit. (See II.A.)
2) Release the machine from the copier. (See I.C.)
3) Remove the rear cover.
4) Remove the two screws, and detach the sort delivery guide [1].

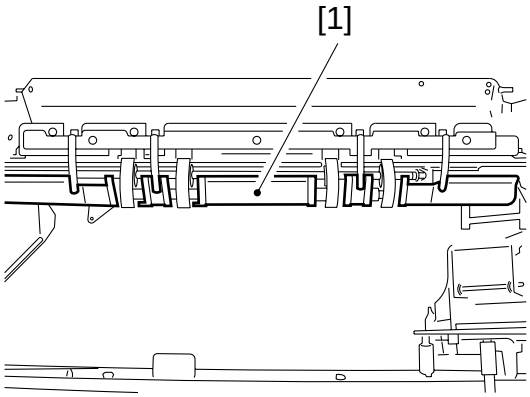

Figure 3-501

5) Remove the E-ring [2] and the bearing [3] from the front of the sort delivery roller.
6) Detach the knurled belt [4] from the sort delivery roller shaft.

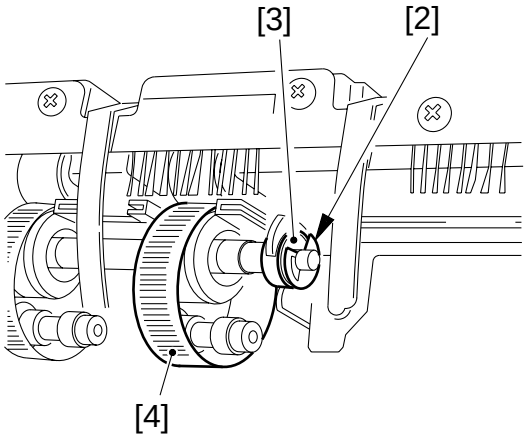

Figure 3-502

Caution:
When mounting the sort delivery guide [1], take care not to trap the paper feeding guide [2].

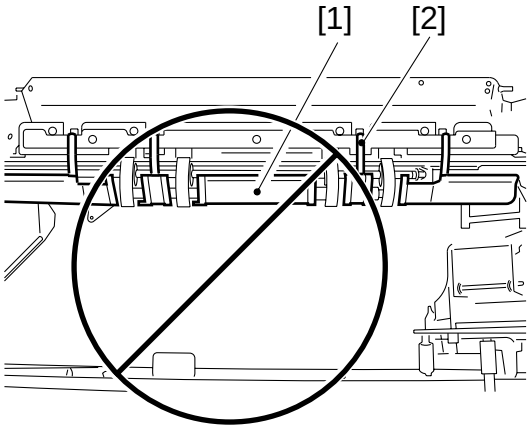

Figure 3-503

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VI . BUFFER ROLLER UNIT

A. Removing the Buffer Roller Unit

1) Open the front cover and the upper cover.
2) Remove the buffer roller knob and the inside cover.
3) Disconnect the connector [1], and remove the screw [2]; then, detach the upper cover sensor mount.

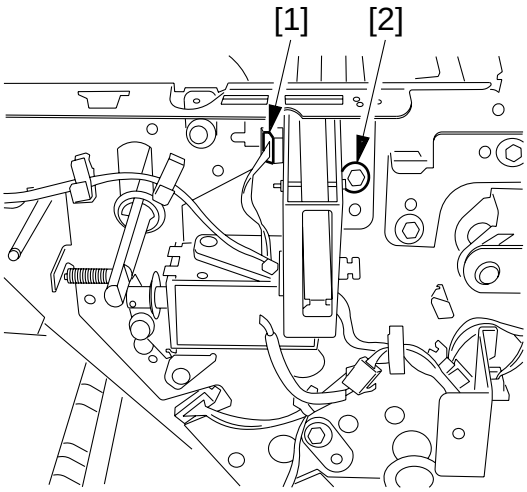

Figure 3-601

4) Disconnect the connector [4], and remove the two screws; then, detach the buffer path switching solenoid (SL1) [3].

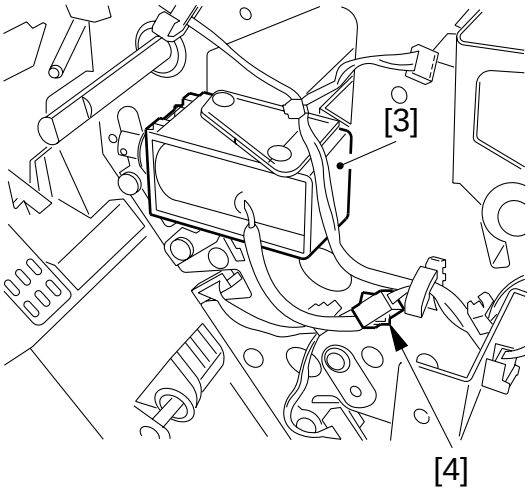

Figure 3-602

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5) Remove the three screws [6], and detach the prism support plate [5].

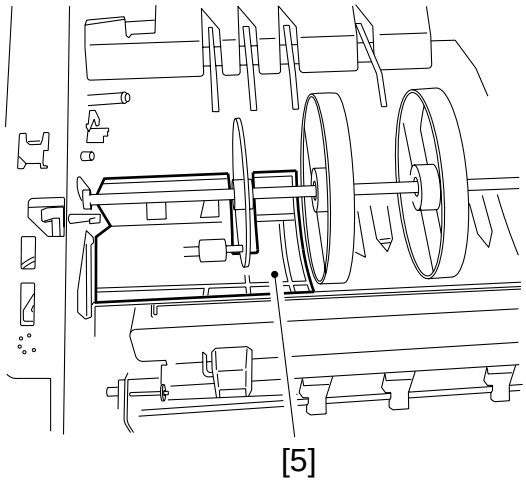

Figure 3-603

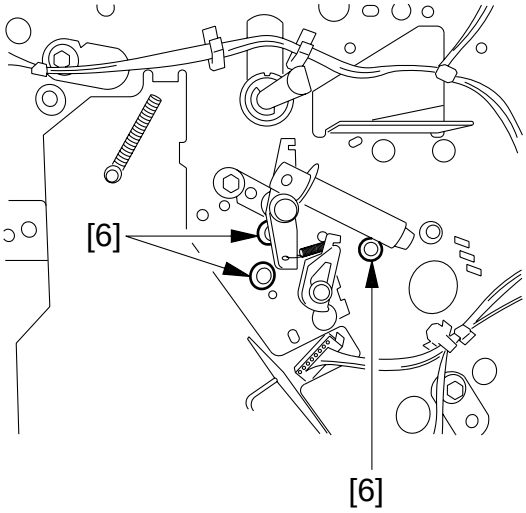

Figure 3-604

6) Remove the E-ring [7] from the front end of the buffer roller shaft, and detach the bearing [8].

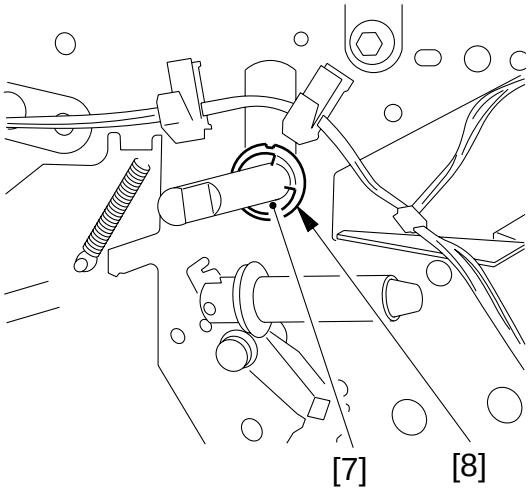

Figure 3-605

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7) Remove the upper rear cover and the rear cover.
8) Remove the E-ring [9] from the rear end of the buffer roller shaft; then, remove the bearing [10].

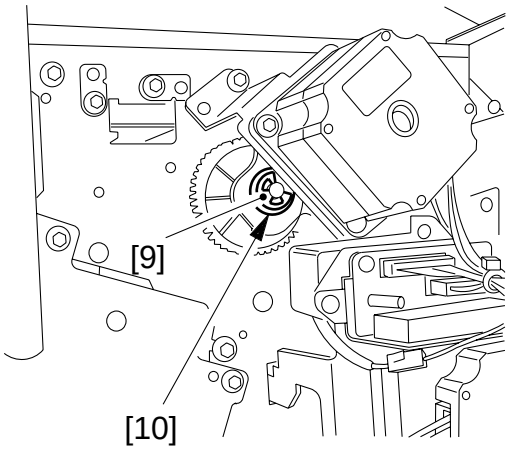

Figure 3-606

9) Disconnect the connector [12], and remove the screws; then, remove the buffer motor [11].

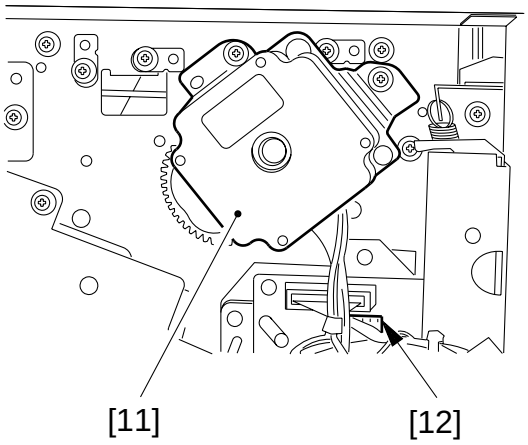

Figure 3-607

10) Remove the E-ring [13] of the buffer roller shaft, and remove the gear [14].

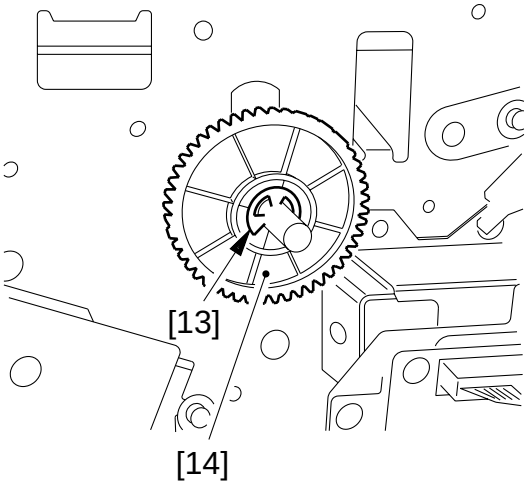

Figure 3-608

11) Remove the buffer roller unit [15].

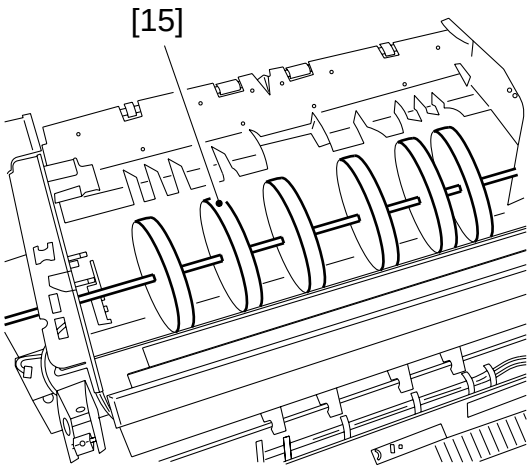

Figure 3-609

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VII . STAPLER UNIT

A. Removing the Stapler Unit

1) Open the front cover.
2) Remove the screw [2], and detach the stapler cover [1].

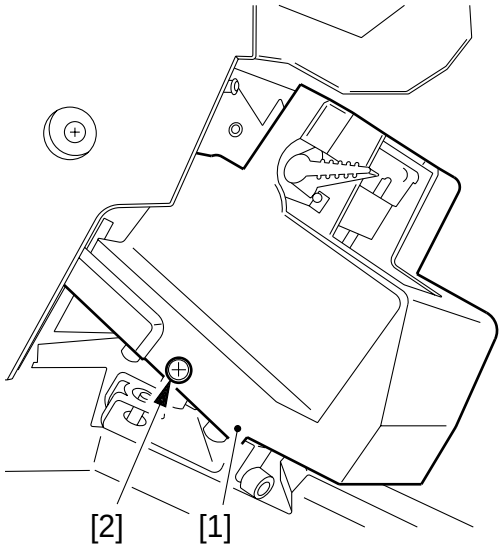

Figure 3-701

3) Remove the two screws [4], and detach the stapler holder [3] from the mount. Before detaching it, be sure to take note of the stapler position index (Figure 3-703).

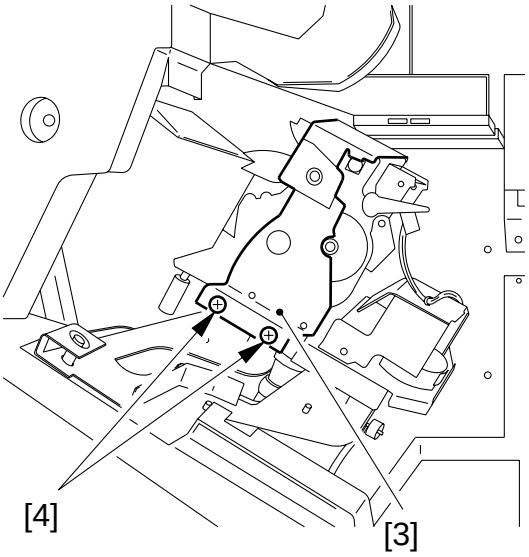

Figure 3-702

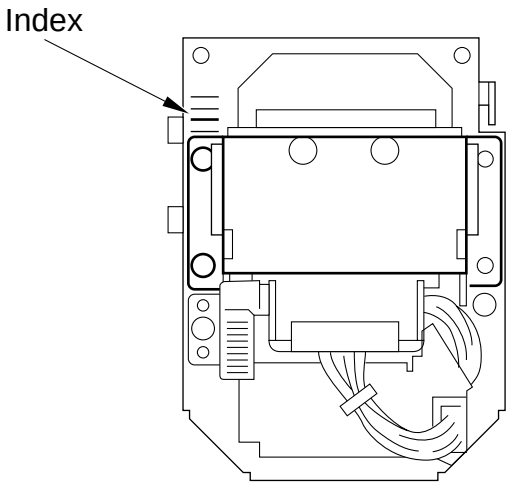

Figure 3-703

4) Disconnect the connector (J49) [5].

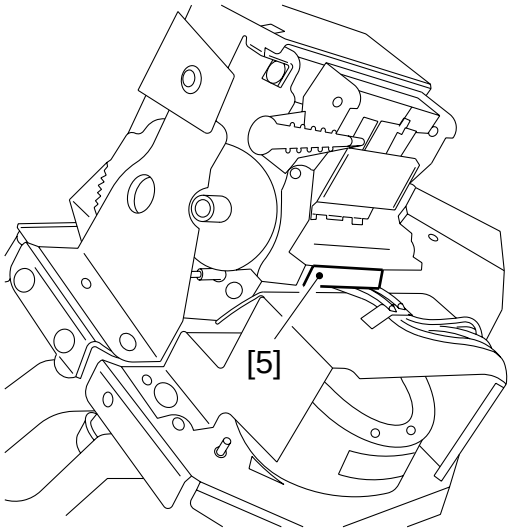

Figure 3-704

5) Remove the two screws [7], and detach the stapler [6] from the stapler holder.

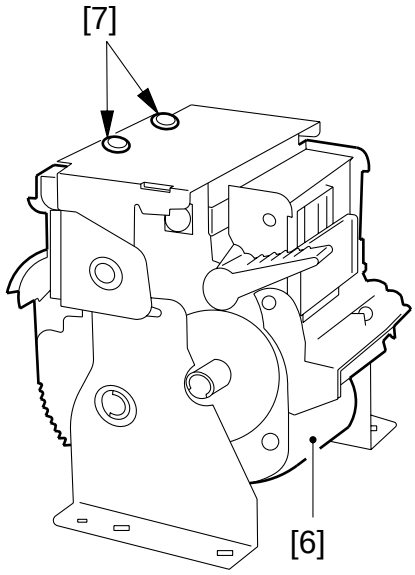

Figure 3-705

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B. Positioning the Stapler Paper Stopper

1) Release the machine from the copier.
2) Move the stapler unit [1] to the center of the rail.
3) Loosen the screw [3] on the stapler paper stopper (let, right) [2].

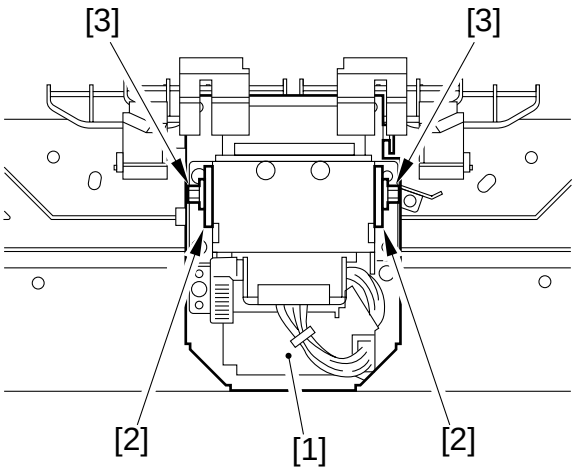

Figure 3-706

4) Holding the swing guide, insert a stack of several sheets [4], and butt it against the rear end stopper [5].

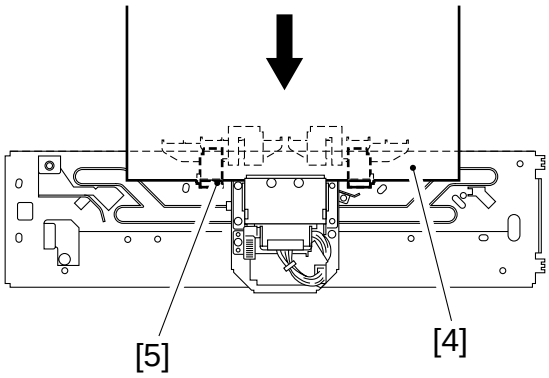

Figure 3-707

5) While butting the stack of sheets [4] against the stapler paper stopper (left, right) [2], tighten the screw [3].

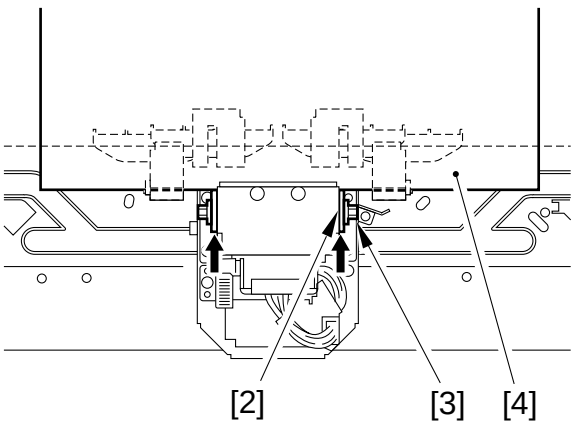

Figure 3-708

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C. Positioning the Stapler

1. Using the Index

Mount the stapler holder with reference to the index noted before detaching it. (Normally, match it at the center of the index.)

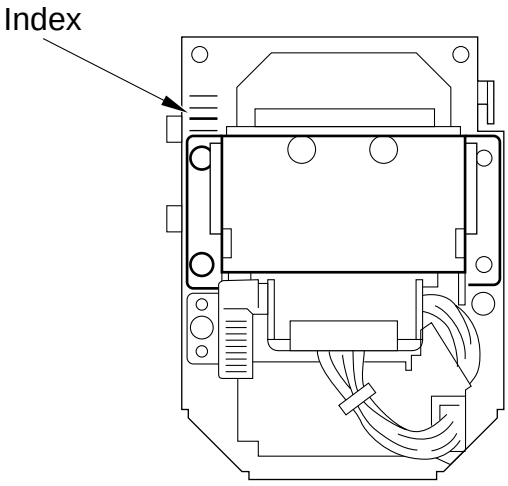

Figure 3-709

2. Using the Stopper

If you are not sure about the index, perform the following; this is also effective when the stapler paper stopper has not been moved:

1) Move the stapler unit [1] to the center of the rail.
2) Loosen the two stapler holder fixing screws [2].

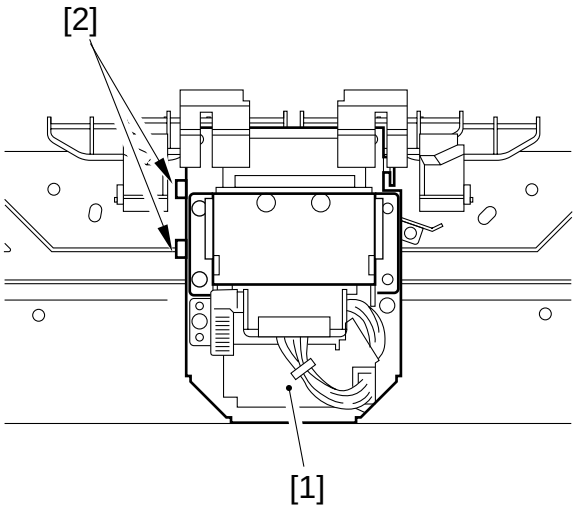

Figure 3-710

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3) While holding the swing guide, insert a stack of sheets [3], and butt it against the rear edge stopper [4].

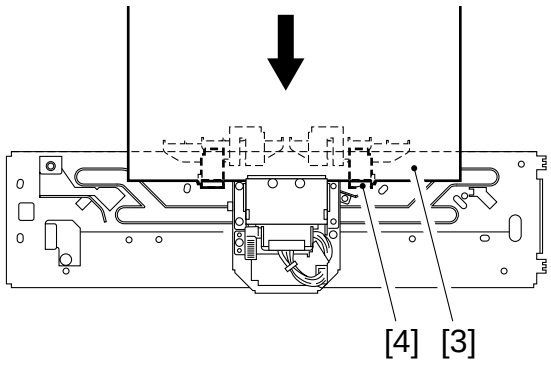

Figure 3-711

4) Slide the stapler holder [6] until the stapler paper stopper [5] comes into contact with the stack of sheets; then, loosen the screws.

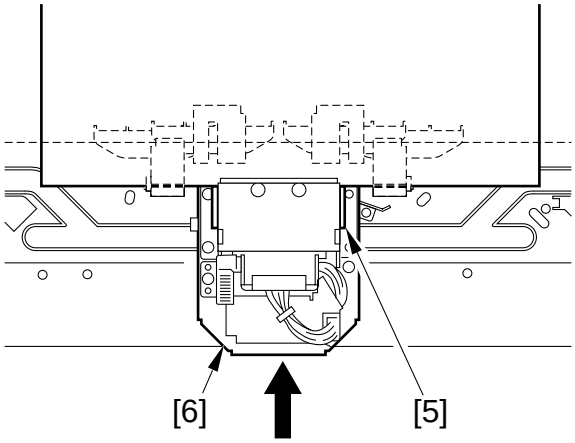

Figure 3-712

3. Positioning by Stapling

If you are not sure about the index because of, for instance, the replacement of the stapler holder and, in addition, the stapler paper stopper has moved, perform the following:

1) Release the machine from the copier.
2) Fix the stapler holder to the mount temporarily. (At this time, try to fit the screw somewhat on the rear side.)
3) Move the stapler [1] to the center of the rail.
4) Loosen the screw of the stapler paper stopper (left, right).
5) While holding the swing guide, insert a stack of sheets [2], and butt it against the rear end stopper [3].

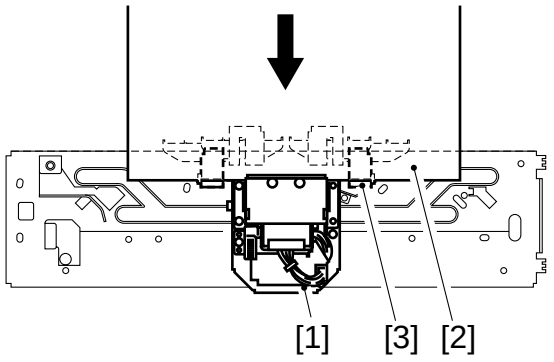

Figure 3-713

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6) Perform manual stapling. (See Chapter 5.)
7) Check the stapling position against the standard.

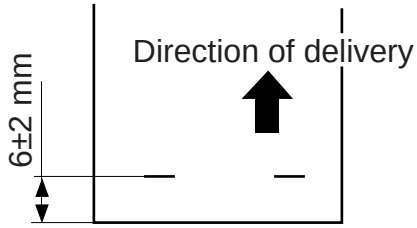

Figure 3-714

8) Move the stapler holder [4] in reference to the index and according to the result of comparison. (Use the two screws [5].)

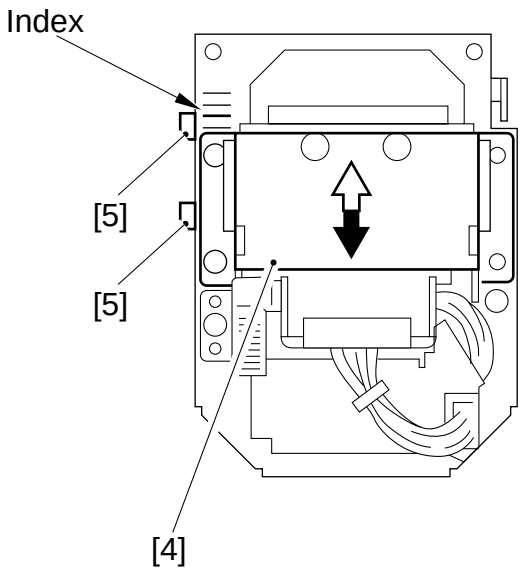

Figure 3-715

9) While lifting the swing guide, insert a stack of sheets [6], and butt it against the rear end stopper [7].

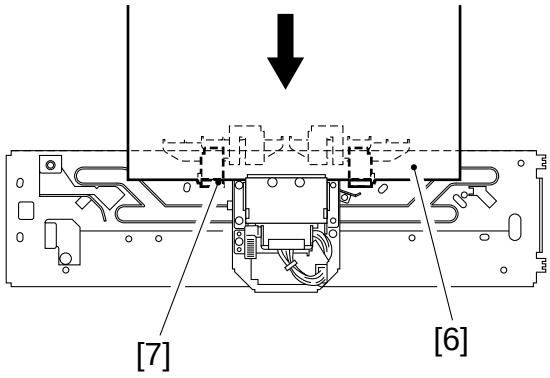

Figure 3-716

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10) Slide the stapler holder [9] until the stapler paper stopper [8] comes into contact with the stack of sheets; then, tighten the screw.

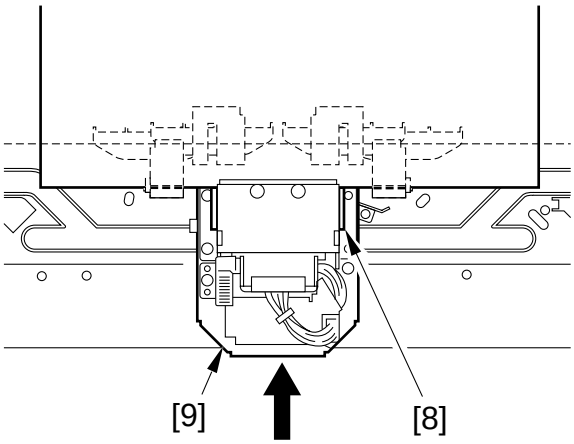

Figure 3-717

4. After Positioning the Stapler

After adjusting the position of the stapler, make sure of the following:

- The knurled belt roll and the stapler edge will not interfere when the knurled belt releasing solenoid is fully pulled while the stapler is in 2-point stapling position.

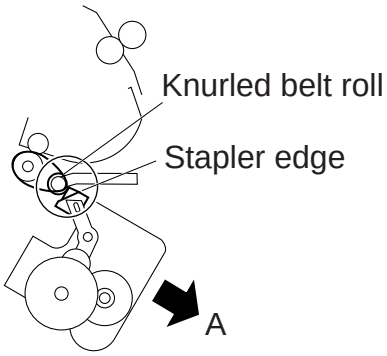

Figure 3-718

If Interference Occurs

1. Check the position of the knurled belt releasing solenoid.
2. Move the stapler in the direction of arrow A until interference stops.

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VIII . PCBs

1. Removing the Finisher Controller PCB

1) Remove the six screws, and detach the rear cover.
2) Disconnect the 18 connectors [1].
3) Remove the six screws [2], and detach the finisher controller PCB [3].

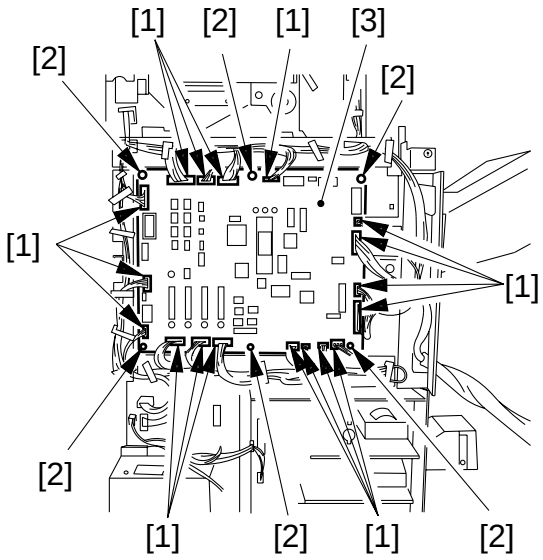

Figure 3-801

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CHAPTER 4

MAINTENANCE AND SERVICING

I. PERIODICALLY REPLACED PARTS 4-1
II. CONSUMABLES AND DURABLES 4-1
III. SCHEDULED MAINTENANCE ..4-1

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I . PERIODICALLY REPLACED PARTS

The machine does not have parts that require replacement on a periodical basis.

II . CONSUMABLES AND DURABLES

Some parts of the machine may require replacement once or more over the period of warranty. Replace the when necessary.

As of October 1998

No.	Parts name	Parts No.	Q'ty	Life	Remarks
1	Stapler	FB4-5390-000	1	500,000 times	A single cartridge is good for about 5,000 stapling operations.
2	Paddle	FB4-8435-000 (FG6-3108-000)	3	1,000,000 sheets	

III . SCHEDULED MAINTENANCE

As of October 1998

Item	Intervals	Description	Remarks
Tray B paper sensor (S4)	As prescribed for the host copier (minimum maintenance intervales)	Cleaning	Use a blower brush.
Inlet path paper sensor (S1)			
Buffer path paper sensor (S2)			
Lower path paper sensor (S3)			

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CHAPTER 5

TROUBLESHOOTING

I. ADJUSTMENT 5-1
A. Electrical System 5-1
II. ARRANGEMENT OF ELECTRICAL PARTS 5-14
A. Sensors 5-14
B. Microswitches 5-16
C. Motors 5-18
D. Solenoids 5-20
E. PCBs 5-22
F. Fans 5-24
G. Light-Emitting Diodes and Check Pins by PCB 5-25
III. TROUBLESHOOTING 5-30
IV. SELF DIAGNOSIS 5-38
A. Self Diagnosis 5-38
B. Alarms 5-40

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I . ADJUSTMENT

A. Electrical System

1. Adjusting the Alignment Width

Perform the following if you have replaced the EEPROM (IC102) of the finisher controller PCB, front jogging plate motor (M4), or rear jogging plate motor (M5):

1) Set SW103 on the finisher controller PCB as follows:

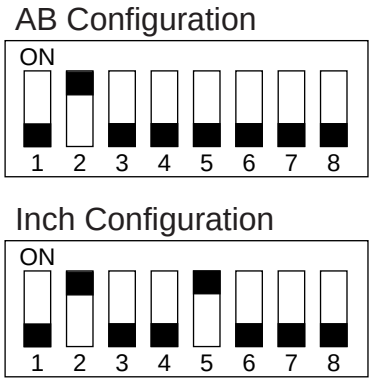

Figure 5-101

2) Press SW104 on the finisher controller PCB.
   • The swing guide of the machine will open and, at the same time, the front jogging plate and the rear jogging plate move to the home position. Thereafter, the rear jogging plate moves to the rear alignment position, while the front jogging plate moves to a point which is 'A4 width or LTR width + α'. LED 101 on the finisher controller PCB will indicate the initial offset value '-4'.
3) Hold a stack of A4 or LTR sheets, and insert it into the processing tray (until the front edge of the stack butts against the rear jogging plate).
4) Butt the rear edge of the stack against the rear jogging plate.
5) Press SW105. A single press moves the front jogging plate toward the rear by about 0.35 mm. A single press, further, increments the indication of the offset value by LED1 on the finisher controller PCB up to '+4'.
   Press the switch as many times as necessary until there is no gap between the front edge of the stack and the front jogging plate.
   • You cannot enter a value higher than '+4'.
6) Press SW104 on the finisher controller PCB.
   • This will store the new value, and the front jogging plate and the rear jogging plate will return to the home position.
   • If you have pressed SW104 too many times and the front jogging plate has moved too far, press SW106 on the finisher controller PCB. In response, the front jogging plate will move to the home position once, and then move back to the adjustment start position. Go back to step 5), and repeat the steps.
7) Turn off the power.
8) Shift all bits of SW103 on the finisher controller PCB to OFF.
9) Turn on the power.
   • The swing guide will move down.

2. Adjusting the Stapling Position (front 1-point stapling)

If you have replaced the EEPROM (IC102) on the finisher controller PCB or the stapler, perform the following:

1) Set SW103 on the finisher controller PCB as follows:

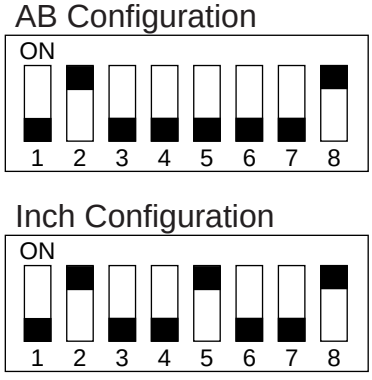

Figure 5-102

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2) Press SW104 on the finisher controller PCB.
   • The swing guide of the machine will open and, at the same time, the front jogging plate and the rear jogging plate will move to the home position. Thereafter, the front jogging plate and the rear jogging plate will move to the front 1-point stapling position.
   At the same time, the stapler moves to the front 1-point stapling position. Further, LED101 on the finisher controller PCB will indicate the present value, which is between '-12' and '14'.
3) Insert a stack of A4 or LTR sheets into the processing tray. At this time, butt the rear edge of the stack against the rear jogging plate.

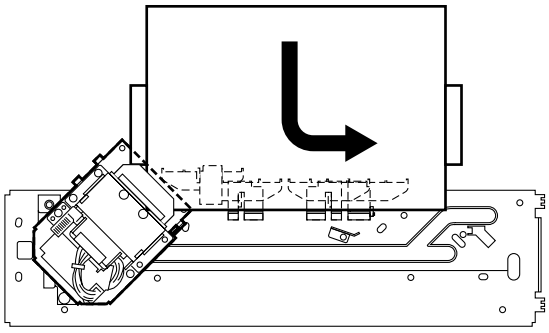

Figure 5-103

   • If the gap between the front jogging plate and the front edge of the stack is 1 mm or more, turn off the power; then, shift all bits of SW103 to OFF, and stop the adjustment work. Adjust the alignment width once again, and start the adjustment of the stapling position.
4) Press SW104 on the finisher controller PCB.
   • The stapler will staple the stack, and LED101 will indicate '0'.
5) Remove the stack, and check the position of the staple against the standard. If the position is correct, end the adjustment work, i.e., turn off the power, shift all bits of SW103 to OFF, and then turn on the power once again.
   If you need to adjust the stapling position, go to the next step.

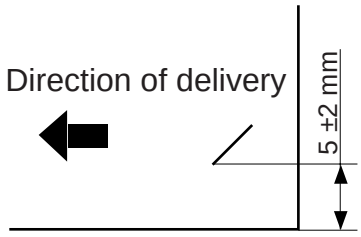

Figure 5-104

6) Press SW104 once so that you may enter a new adjustment value.
   • The stapler will return to the home position once, and then will return to the stapling position. LED101 will indicate the present value.
7) Based on the result of a check, press SW105 or SW106 on the finisher controller PCB.
   • A single press on SW105 moves the stapling position to the front by about 0.35 mm. LED101 indication, on the other hand, will increment by '1' in the positive (+) direction.
   • A single press SW106 moves the stapling direction to the rear by about 0.35 mm. LED101, on the other hand, will increment by '1' in the negative (-) direction.
8) Insert a stack of several A4 or LTR sheets into the processing tray as in step 3).
9) Press SW104 so that the new adjustment value is stored.
   • Stapling occurs automatically so that you can check the stapling position. LED 101 will indicate '0'.
10) Turn off the power.
11) Shift all bits of SW103 to OFF.
12) Turn on the power, and move down the swing guide.

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3. Adjusting the Stapling Position (2-point stapling)

If you have replaced the EEPROM (IC102) on the finisher controller PCB or the stapler, perform the following:

1) Set SW103 on the finisher controller PCB as follows:

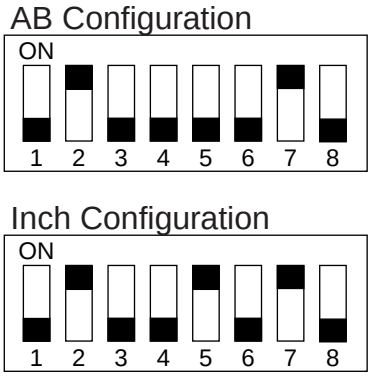

Figure 5-105

2) Press SW104 on the finisher controller PCB
   - The swing guide of the finisher will open and, at the same time, the front jogging plate and the rear jogging plate will move to the home position. Thereafter, the front jogging plate and the rear jogging plate will move to the 2-point stapling position. LED101 on the finisher controller PCB will indicate the present value, which is between '-12' and '14'.
3) Insert a stack of several A4 or LTR sheets into the processing tray. At this time, be sure to butt the rear edge of the stack against the rear jogging plate.

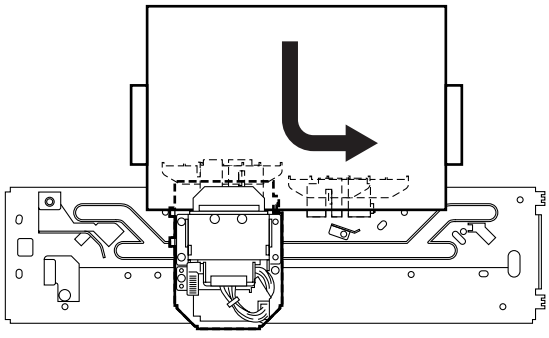

Figure 5-106

   - If the gap between the front jogging plate and the front edge of the stack is 1 mm or more, turn off the power, shift all bits of SW103 to OFF, and stop the adjustment work. Thereafter, adjust the alignment width, and then start the stapling position adjustment work.
4) Press SW104 on the finisher controller PCB.
   - Stapling will occur, and LED101 will indicate '0'.
5) Remove the stack, and check the position of the staple against the standard. If the position is correct, end the adjustment work, i.e., turn off the power, shift all bits of SW103 to OFF, and turn on the power once again.
   If the stapling position must be adjusted, go to the next step.

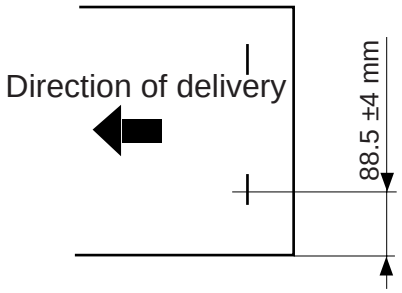

Figure 5-107

6) Press SW104 once so that you may enter a new adjustment value.
   - The stapler will move to the home position once, and then will move to the stapling position once again. LED101, on the other hand, will indicate the present value.
7) Press SW105 or SW106 on the finisher controller PCB as necessary.
   - A single press on SW105 will move the stapling position to the front by about 0.35 mm. LED101, on the other hand, will increment by '1' in the positive (+) direction.
   - A single press on SW106 will move the stapling position to the rear by about 0.35 mm. LED101, on the other hand, will increment by '1' in the negative (-) direction.
8) Insert a stack of several A4 or LTR sheets into the processing tray as in step 3).

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9) Press SW104 once to store the new adjustment value.
   • Stapling will occur automatically so that you can check the stapling position. LED101 will indicate '0'.
10) Turn off the power.
11) Shift all bits of SW103 to OFF.
12) Turn on the power, and move down the swing guide.

4. Adjusting the Stapling Position (rear 1-point stapling)

If you have replaced the EEPROM (IC102) on the finisher controller PCB or the stapler, perform the following:

1) Set SW103 on the finisher controller PCB as follows:

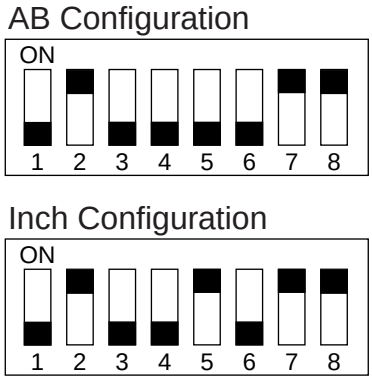

Figure 5-108

2) Press SW104 on the finisher controller PCB.
   • The swing guide of the machine will open and, at the same time, the front jogging plate and the rear jogging plate will move to the home position. Thereafter, the front jogging plate and the rear jogging plate will move to the rear 1-point stapling position. The stapler will also move to the rear 1-position stapling position. LED101 on the finisher controller PCB will indicate the present value, which is between '-12' and '14'.
3) Insert a stack of several A4 or LTR sheets into the processing tray. At this time, be sure to butt the rear edge of the stack against the rear jogging plate.

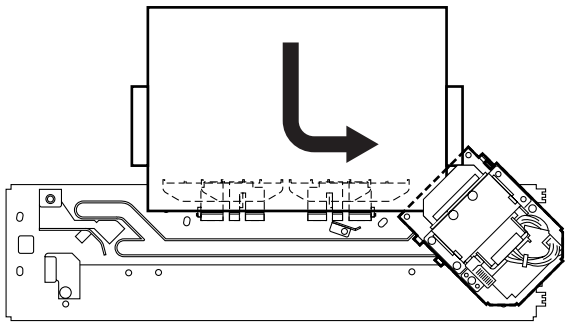

Figure 5-109

   • If the gap between the front jogging plate and the front edge of the stack is 1 mm or more, turn off the power, shift all bits of SW103 to OFF, and stop the adjustment work. Perform the alignment width adjustment, and then perform the stapling position adjustment once again.
4) Press SW104 on the finisher controller PCB.
   • Stapling will take place, and LED101 will indicate '0'.
5) Take out the stack of sheets, and check the position of the staple against the standard. If the position is correct, end the adjustment work, i.e., turn off the power, shift all bits of SW103 to OFF, and then turn on the power. If the stapling position must be adjusted, go to the next step.

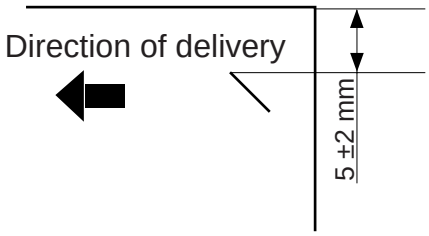

Figure 5-110

6) Press SW104 once so that you can enter a new value.
   • The stapler will return to the home position, and then will return to the stapling position once again. LED101, on the other hand, will indicate the present value.

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7) Based on the result of the check, press SW105 or SW106 on the finisher controller PCB.
   - A single press on SW105 will move the stapling position to the front by about 0.35 mm. The indication of LED101, on the other hand, will increment by '1' in the positive (+) direction.
   - A single press on SW106 will move the stapling position to the rear by about 0.35 mm. The indication of LED101, on the other hand, will increment by '1' in the negative '0' direction.
8) Insert a stack of several A4 or LTR sheets into the processing tray as in step 3).
9) Press SW104 once so that you can enter a new adjustment value.
   - Stapling will occur automatically so that you can check the stapling position. LED101 will indicate '0'.
10) Turn off the power.
11) Shift all bits of SW103 to OFF.
12) Turn on the power, and move down the swing guide.

5. Adjusting the Wrapping on the Buffer Roller

Perform the adjustments for the following:

a. If you have replaced the EEPROM (IC102) on the finisher controller PCB.
b. If the degree of wrapping has changed for some reason.
   The "degree of wrapping" refers to the discrepancy between the first and the second sheets wrapping around the buffer roller.

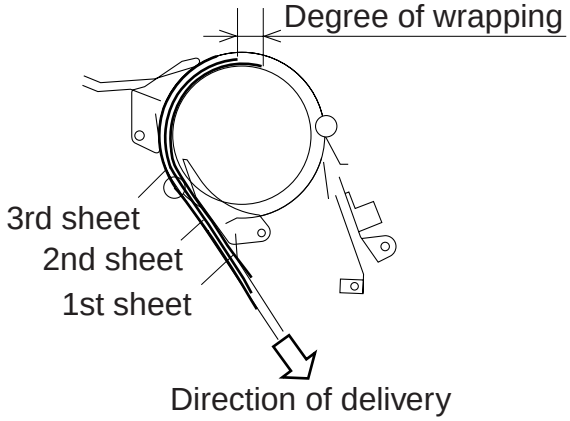

Figure 5-111

1) Set SW103 on the finisher controller PCB as follows:

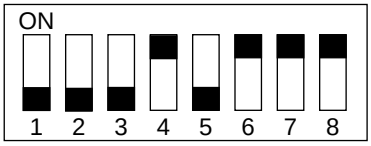

Figure 5-112

2) Set the copier's mode as follows: copy count at 2, originals at 3, and sort mode selected.
3) Press the Copy Start key.
   - Copying will start and stop as soon as paper has wrapped around the buffer roller.
4) Open the front cover and the upper cover, and measure the discrepancy between the sheets.
   - After measurement, remove the stack.
5) Check the degree of wrapping (discrepancy) against the standard.

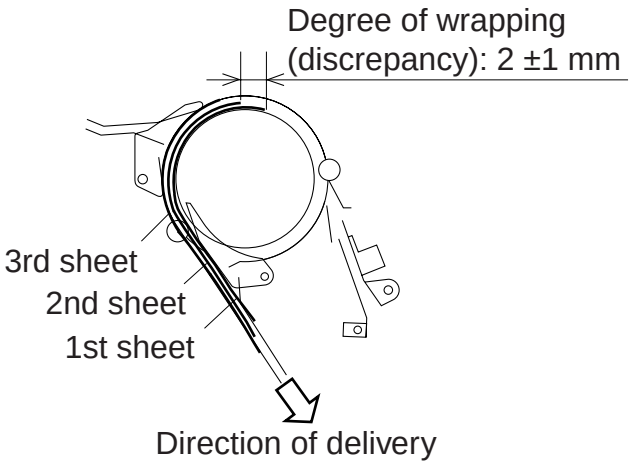

Figure 5-113

6) Turn off the power, and set SW103 on the finisher controller PCB as follows:

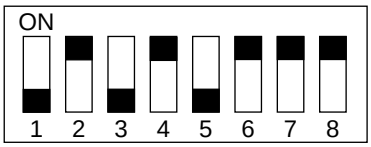

Figure 5-114

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Caution:
The machine may not operate properly if the upper cover or the front cover is not closed firmly.

7) Turn on the power, and press SW104 on the finisher controller PCB.
   • LED101 will indicate the present value.
8) Press SW105 or SW106 on the finisher controller PCB as necessary.
   • Each press on SW105 increases the degree of wrapping by about 1.74 mm.
   • Each press on SW106 decreases the degree of wrapping by about 1.74 mm.

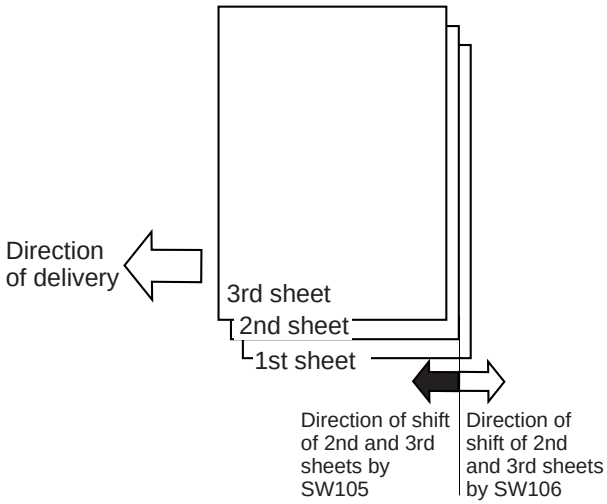
Direction of delivery
3rd sheet
2nd sheet
1st sheet
Direction of shift of 2nd and 3rd sheets by SW105
Direction of shift of 2nd and 3rd sheets by SW106

Figure 5-115

9) Press SW104 on the finisher controller PCB.
   • The new value will be stored, and LED101 will indicate '0'.
10) Turn off the power, and shift all bits of SW103 to OFF.

6. Sensor Initial Adjustment

Perform the adjustment if you have replaced any of the following sensors or the EEPROM (IC102) on the finisher controller PCB:
- Inlet path paper sensor (S1)
- Buffer path paper sensor (S2)
- Lower path paper sensor (S3)
- Tray B paper sensor (S4)

1) Check to make sure that there is no paper in the paper path or on tray B. Then, close the upper cover and the front cover.
2) Set SW103 on the finisher controller PCB as follows:

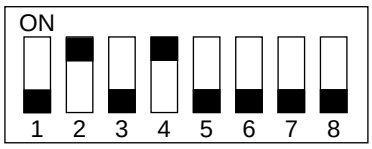

Figure 5-116

3) Press SW104 on the finisher controller PCB.
   • This will start adjustment mode, and tray B will move to the 1000-sheet stacking position. (This is to prevent blocking the tray B paper sensor (S4).)
4) See LED101 on the finisher controller PCB to find out which sensor is being adjusted. (Table 5-101)

No.	Sensor
1	Inlet path paper sensor (S1)
2	Buffer path paper sensor (S2)
3	Lower path paper sensor (S3)
4	Tray B paper sensor (S4)

Table 5-101

5) When adjustment has ended, find out the result by referring to LED101.
   • If LED101 indicates '0', all sensors are normal.
   • If LED101 indicates 'F', the output level of one of the sensors is not adequate.
6) Press SW105 or SW106 on the finisher controller PCB to indicate details of the result.
   • See Tables 5-102 and -103 for the No. of each sensor and how details of the result are indicated.
   • A press on SW105 for a second time moves to the next sensor, while a press on SW106 moves to the previous sensor.

No.	Sensor
1	Inlet path paper sensor (S1)
2	Buffer path paper sensor (S2)
3	Lower path paper sensor (S3)
4	Tray B paper sensor (S4)

Table 5-102

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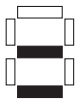
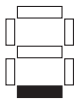
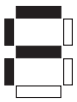
Level 3	Level 2	Level 1	Level 0
			
Indicates that the sensor output level is adequate.	Indicates that the sensor output level is starting to lower.	Indicates that the sensor output level is near the limit for use.	Indicates that the sensor output level is below the limit for use.

Table 5-103

- If the result is level 2, level 1, or level 0, clean the sensor or its mounting condition.
- If the result is still level 1 after cleaning the sensor and checking its mounting condition, be ready for the replacement of the sensor.
- If the result is level 0 after cleaning the sensor, checking its mounting condition, and adjusting it once again, replace the sensor.

7) Press SW104 on the finisher controller PCB.
   - The press will complete the adjustment.
   - Tray B will move up to its initial position.
8) Turn off the power, and shift all bits of SW103 to OFF.

7. Adjusting the Swing Guide Speed

Perform the adjustment if you have replaced the EEPROM (IC102) on the finisher controller PCB or the swing motor (M8) or parts associated with it.

1) Set SW103 on the finisher controller PCB as follows:

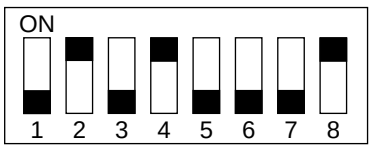


Figure 5-117

2) Press SW104 on the finisher controller PCB.
   - This will start automatic adjustment, and the swing guide will make several swinging operations.
   - The output voltage to the swing motor drive circuit will automatically be adjusted so that the time (T1) between when the swing motor drive starts and the swing guide closed sensor (PI15) turns off will be as indicated.
3) When the automatic adjustment has ended, check LED101 on the finisher controller PCB to find out the result:
   - If the output voltage has been adjusted so that T1 is the optimum value, data representing the output voltage will be indicated. (in 3 digits, 000 through 255)
   - If the output voltage has been adjusted so that T1 will be shorter than the optimum value, 'F' and '1' will be indicated in sequence.
   - If the output voltage has been adjusted so that T1 will be longer than the optimum value, 'F' and '2' will be indicated in sequence.
4) Press SW104 on the finisher controller PCB.
   - This will complete the adjustment.
   - If T1 is longer or shorter, the default output voltage will be selected.
5) Turn off the power.
6) Shift all bits of SW103 to OFF.

Reference:

If the swing guide has been used for a long time and, as a result, the sound of the guide moving up increases, perform this adjustment so that the motor drive speed will be optimum, reducing the sound.

8. Indicating the Swing Guide Speed

Use this mode to find out the time taken by the swing guide to move up or move down; if jams occur frequently near the swing guide, check the time taken for these movements.

1) Set SW103 on the finisher controller PCB as follows:

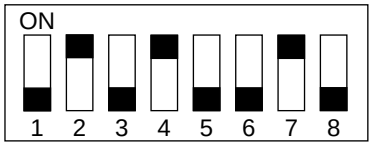


Figure 5-118

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2) Press SW104 on the finisher controller PCB.
   • The swing guide swings several times, and the time taken for upward and downward movements will be measured automatically.
3) When the swing guide stops, check LED101 for the result:
   • If LED101 indicates '0', the time is within the standard range.
   • If LED101 indicates 'F', the time is outside the standard range.
4) Press SW105 or SW106 on the finisher controller PCB.
   • LED101 indicates the times taken for upward and downward movements.
   • A press on SW106 indicates the time for upward movement, a press on SW105 indicates the time for downward movement.
   • In the case of upward movement, 'a', 'b', and 'c' will be indicated in sequence.
   • In the case of downward movement, 'a', 'b', and 'c' will be indicated in sequence. Where, 'a' indicates the 100's;
   b', 10's;
   'c', 1's in msec.

Reference:

The standard time for upward movement is 250 ± 15 msec. The standard time for downward movement is 320 ± 20 msec.

5) Turn off the power.
6) Shift all bits of SW103 to OFF.

Reference:

If the time is longer, check the swing mechanism for a mechanical fault.

9. After Replacing the EEPROM (IC102)

1) Turn off the copier.
2) Set SW103 on the finisher controller PCB as follows:

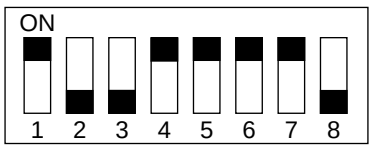

Figure 5-119

3) Turn on the power.
4) Press SW104 and SW105 on the finisher controller PCB at the same time.
   • This will initialize the EEPROM.
5) Make the adjustments shown in Table 5-104.

• Alignment width • Stapling position (front, 1-point stapling) • Stapling position (2-point stapling) • Stapling position (rear, 1-point stapling) • Buffer roller wrapping degree • Sensor (initial) • Swing guide speed

Table 5-104

10. Replacing the Finisher Controller PCB (for E505)

1) Turn off the copier.
2) Remove the EEPROM (IC102) from the new PCB. (Do not throw away the ROM yet.)
3) Remove the EEPROM from the old PCB, and fit it into the socket (ICS102) on the new PCB.
4) Remove the old PCB from the finisher, and mount the new PCB to the machine.
5) Turn on the copier. If the copier does not indicate 'E505', end the work (the contents of the memory on the old PCB have been backed up on the new PCB). If the copier indicates 'E505', go to the next step.

→ If 'E505' recurs, the EEPROM is faulty. You must not use the old EEPROM to back up the memory.

6) Turn off the copier, and replace the old EEPROM mounted to the new PCB with the new EEPROM.
7) Perform the steps under 9. "After Replacing the EEPROM."

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11. Initializing the RAM

1) Set SW103 on the finisher controller PCB as follows:

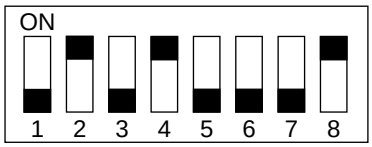


Figure 5-120

2) Press SW104 and SW105 on the finisher controller PCB at the same time.
   • This will initialize the RAM.
3) Turn off the power, and shift all bits of SW103 to OFF.

12. Selecting Upward Curling Paper Mode

a. Outline

At times, the condition of paper causes it to curl upward when stacked on tray B, hindering the stacking of subsequent stacks. (See Figures 5-121and 122.)

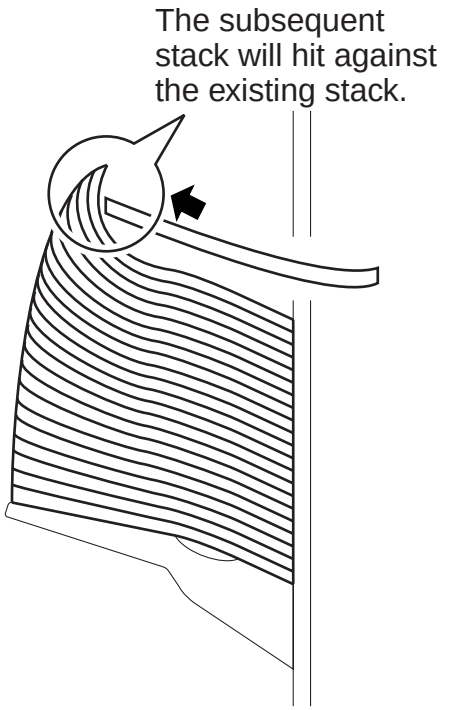


Figure 5-121

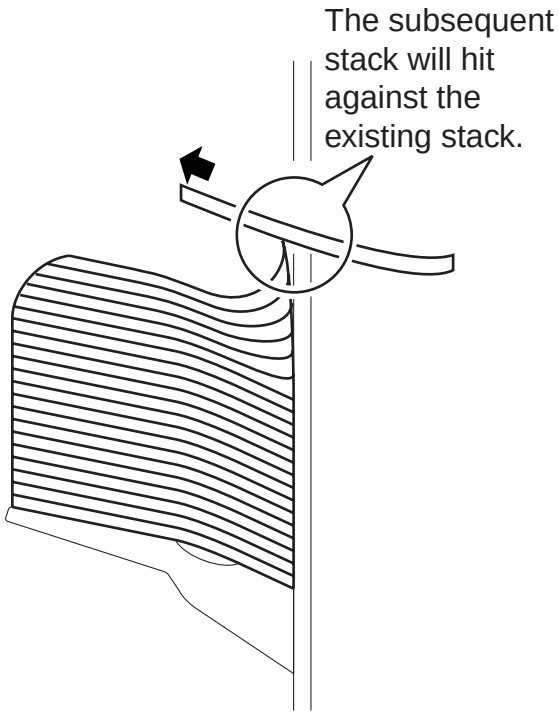


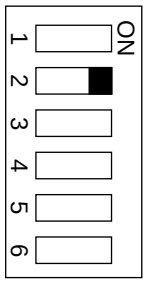
Figure 5-122

If such a problem occurs,

1) Turn over the paper inside the pickup cassette.
   If the upward curling is larger than the previous placement, turn over the paper inside the pickup cassette once again.
   If the upward curling continues to increase and subsequent stacks do not fall correctly on the existing stack, select upward curling paper mode.

b. Selecting Upward Curling Paper Mode

1) Turn off the power.
2) Set SW107 on the finisher controller PCB as follows:



With the exception of bit 2, the setting varies depending on the selected mode and specifications.

Figure 5-123

3) Turn on the power.
   - In this mode, the speed at which the stack is delivered is increased so that the stack may fall without getting hooked on its trailing edge even when it hits against the existing stack. The rate of increase depends on the number of sheets the stack contains.
   - When paper free of curling or paper with downward curling is used after selecting this mode, the high speed of delivery can cause the stacks to fall away from the stacking wall (Figure 5-124). As such, be fully sure when selecting this mode by thoroughly studying the type of paper used by the user.

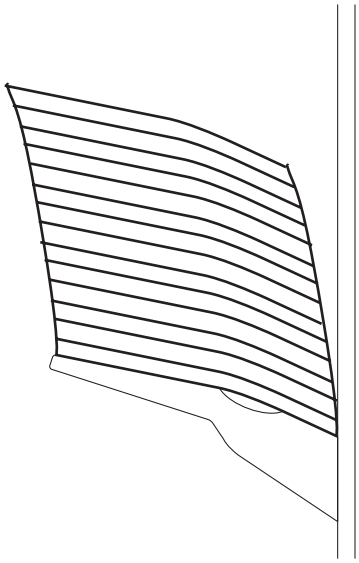


Figure 5-124

13. Selecting Downward Curl Mode

a. Outline

Depending on the condition, some types of paper tend to curl appreciably downward while being deposited on the processing tray.

When a stack is delivered, its bottom sheets can become trapped by the existing stack, causing them to roll between stacks as shown in Figure 5-125.

This problem is noted with A4 or LTR sheets.

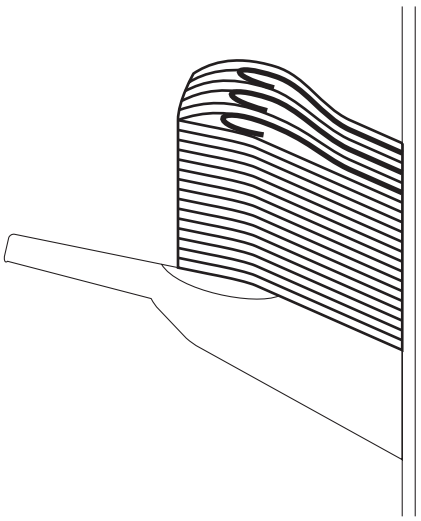


Figure 5-125

b. Cause

1) Sheets with downward curling tend to hang when they are being deposited on the processing tray. (The hanging occurs at the front and rear edges of the sheets, where they are not supported by the tray auxiliary plate as shown in Figure 5-126.)

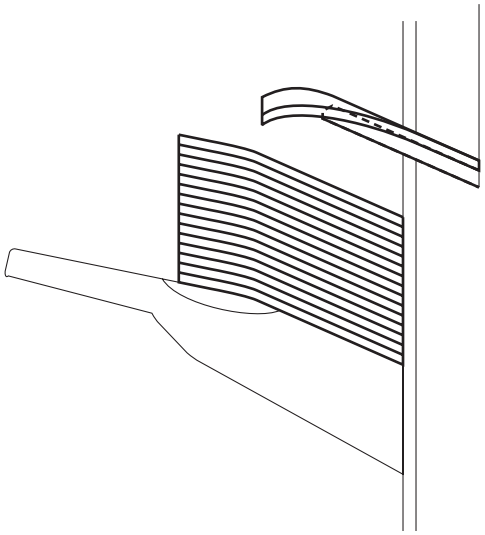


Figure 5-126

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2) When the tray auxiliary plate is retracted before the sheets are released, the sheets will hang still farther, causing their edges to come into contact with the existing sheets on tray B as shown in Figure 5-127.

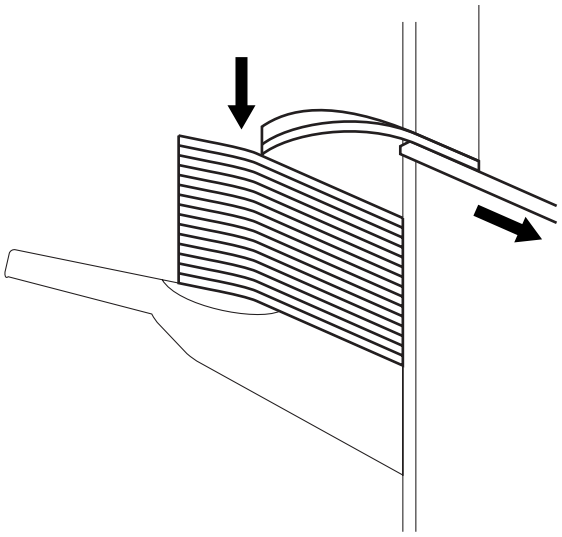


Figure 5-127

3) When the stack is released while the edges of the sheets are in contact with the existing sheets, the bottom sheets are likely to roll down and back between stacks as shown in Figure 5-128.

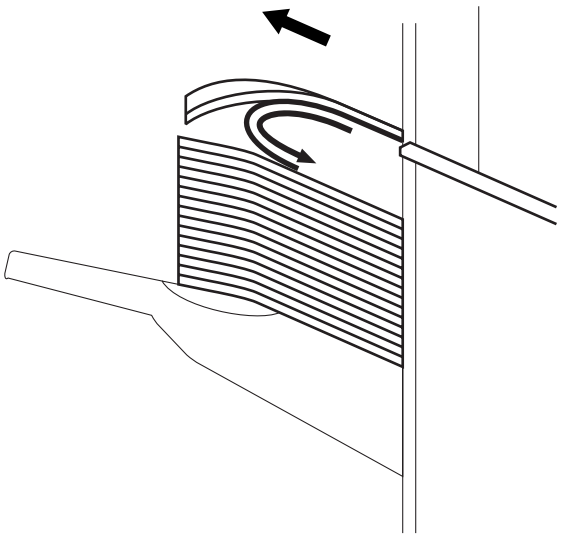


Figure 5-128

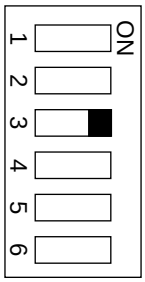
c. Points to Note for Servicing

If the condition described in b. is noted, turn over the stack of sheets inside the cassette, and make copies.

- If the stacks are deposited normally, end the work.
- If curling has increased after turning over the stack of paper inside the cassette, turn it back, and select downward curl mode.
- If curling has decreased but the stacks are not deposited properly as shown in Figure 5-125, select downward curl mode.

d. Selecting Downward Curl Mode

1) Turn off the copier.
2) Remove the screw, and detach the PCB cover. Then, shift bit 3 of SW107 on the finisher controller PCB to the ON position as shown in Figure 5-129.
3) Mount back the PCB cover with the screw, and turn on the copier.



For bits other than bit 3, use the settings specific to the model and the mode.

Figure 5-129

e. Operation in Downward Curl Mode

1) Retraction of the Tray Auxiliary Plate
In normal mode, stacking occurs after retracting the tray auxiliary plate as shown in Figure 5-130. In downward curl mode, on the other hand, stacking is executed while retracting the tray auxiliary plate as shown in Figure 5-131.

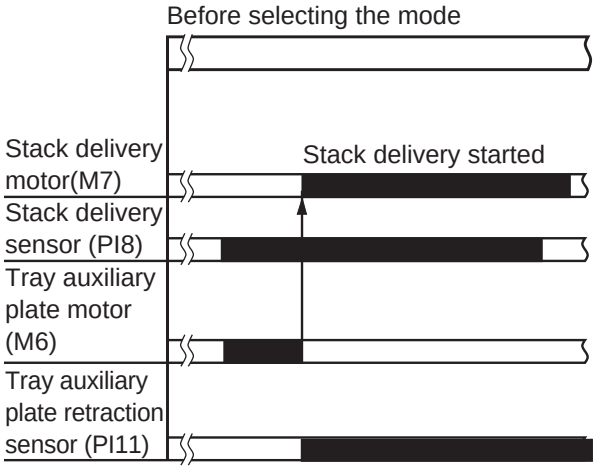

Before selecting the mode
Stack delivery motor(M7)
Stack delivery started
Stack delivery sensor (PI8)
Tray auxiliary plate motor (M6)
Tray auxiliary plate retraction sensor (PI11)

Figure 5-130

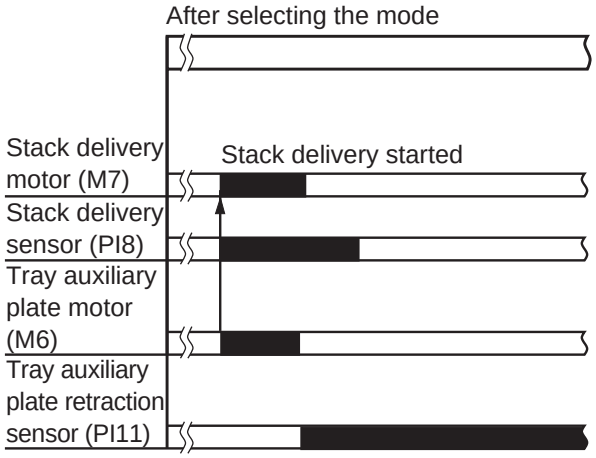

After selecting the mode
Stack delivery motor (M7)
Stack delivery started
Stack delivery sensor (PI8)
Tray auxiliary plate motor (M6)
Tray auxiliary plate retraction sensor (PI11)

Figure 5-131

2) Detecting the Height of Tray B
The height correction operation will not be executed even if the user adds paper to tray B while the processing tray is in operation.

3) Operating Conditions
The mode is executed when a stack of two or more sheets is being deposited on the processing tray.

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II . ARRANGEMENT OF ELECTRICAL PARTS

A. Sensors

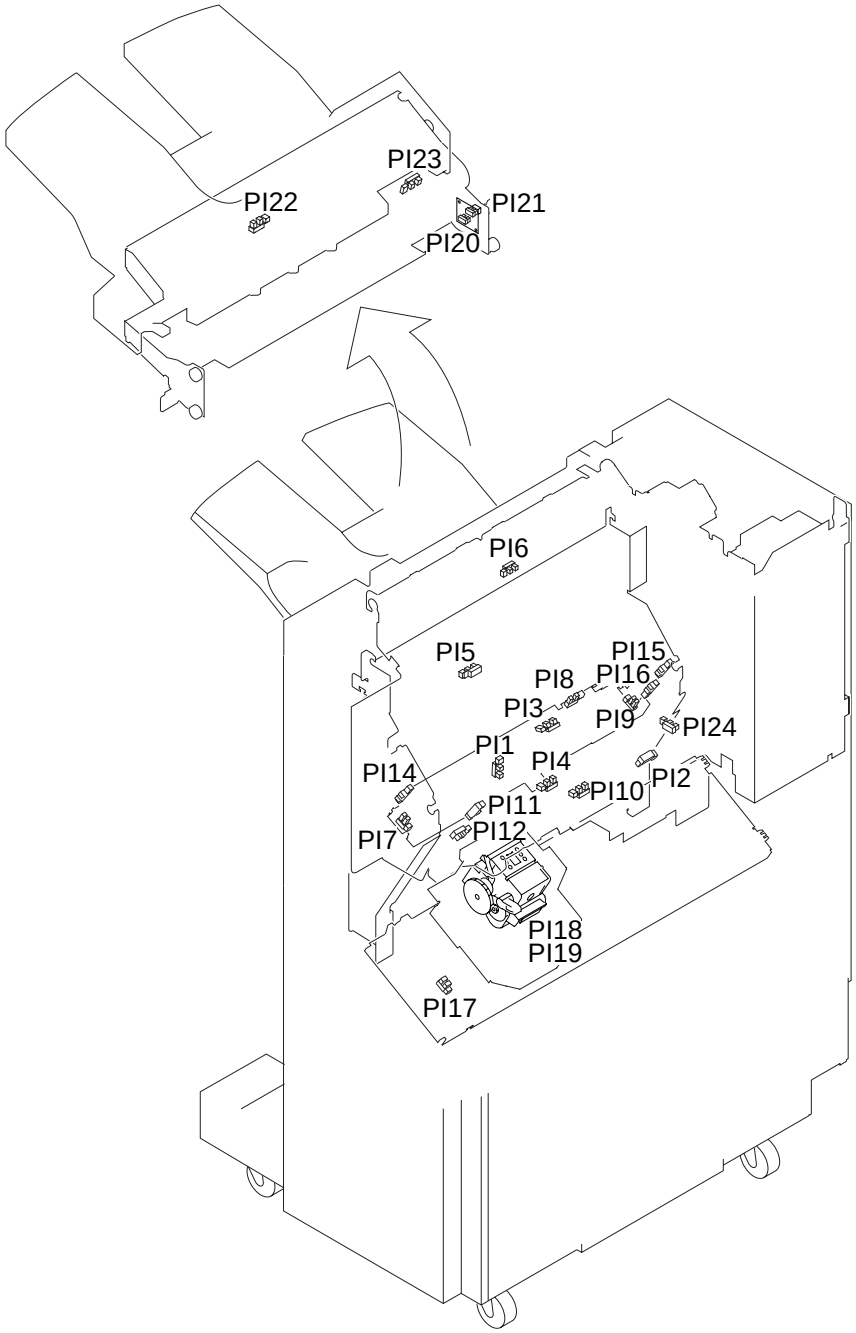

Figure 5-201

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Name	Notation	Function
Sensor	PI1	Front door detection
	PI2	Inlet path paper detection
	PI3	Buffer path rear paper detection
	PI4	Sort delivery detection
	PI5	Upper cover open detection
	PI6	Non-sort delivery paper detection
	PI7	Front jogging plate home position detection
	PI8	Stack delivery detection
	PI9	Rear jogging plate home position detection
	PI10	Swing motor clock detection
	PI11	Tray auxiliary plate retraction detection
	PI12	Stack feeder motor clock detection
	PI14	Paddle home position detection
	PI15	Swing guide closed detection
	PI16	Swing guide open detection
	PI17	Stapler shift home position detection
	PI18	Staple edging detection (inside the stapler)
	PI19	Stapling home position detection (inside the staple)
	PI20	Tray B upper position detection
	PI21	Tray B lower position detection
	PI22	Tray B paper detection
	PI23	Tray B idle rotation detection
	PI24	Tray B lower limit detection

Table 5-201

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B. Microswitches

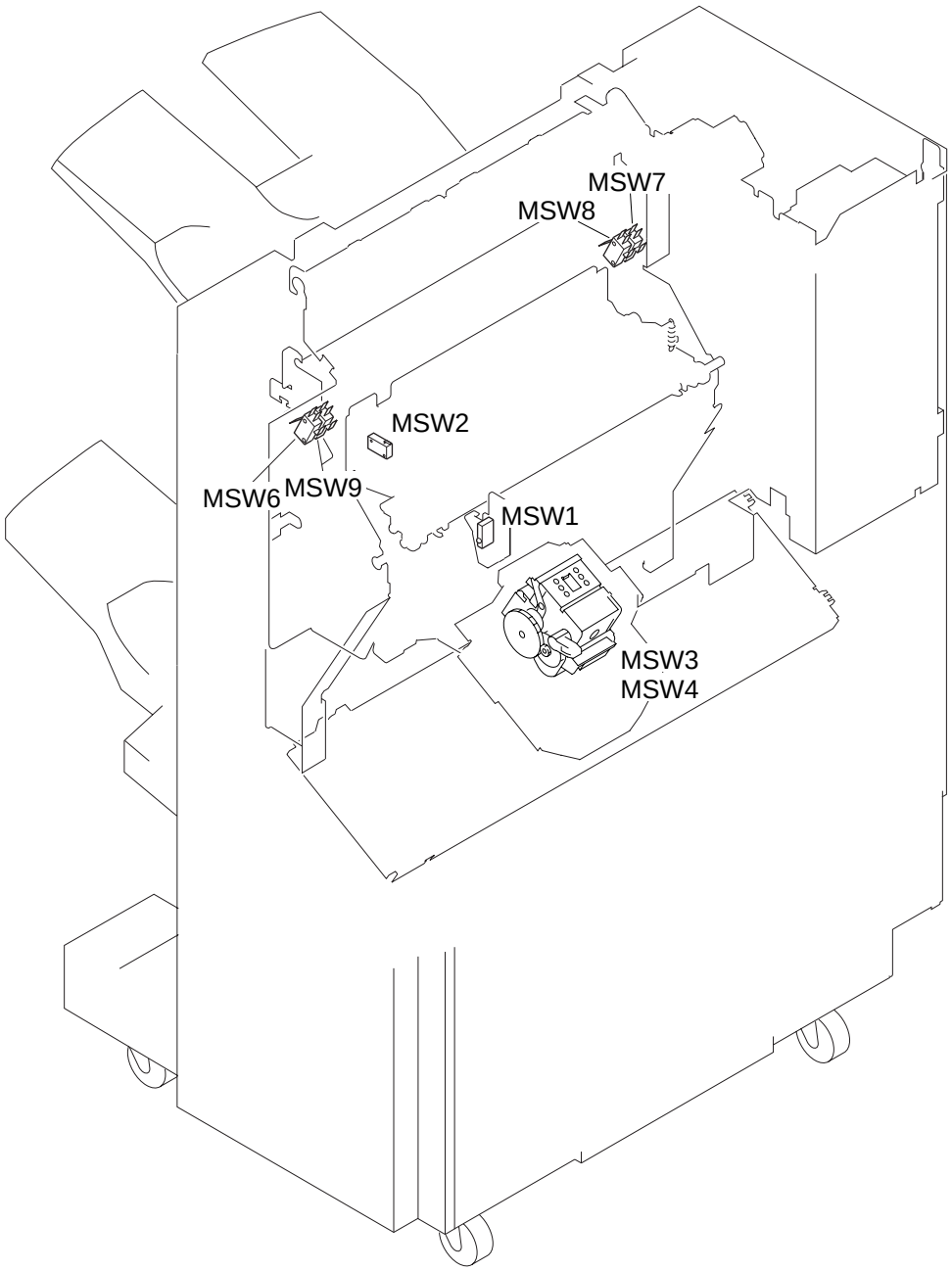

Figure 5-202

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Name	Notation	Function
Microswitches	MSW1	Front door open detection
	MSW2	Swing guide open detection
	MSW3	Staple detection (inside the stapler)
	MSW4	Cartridge detection (inside the stapler)
	MSW6	Tray safety detection (front)
	MSW7	Tray safety detection (rear)
	MSW8	Stapler safety detection (rear)
	MSW9	Stapler safety detection (front)

Table 5-202

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C. Motors

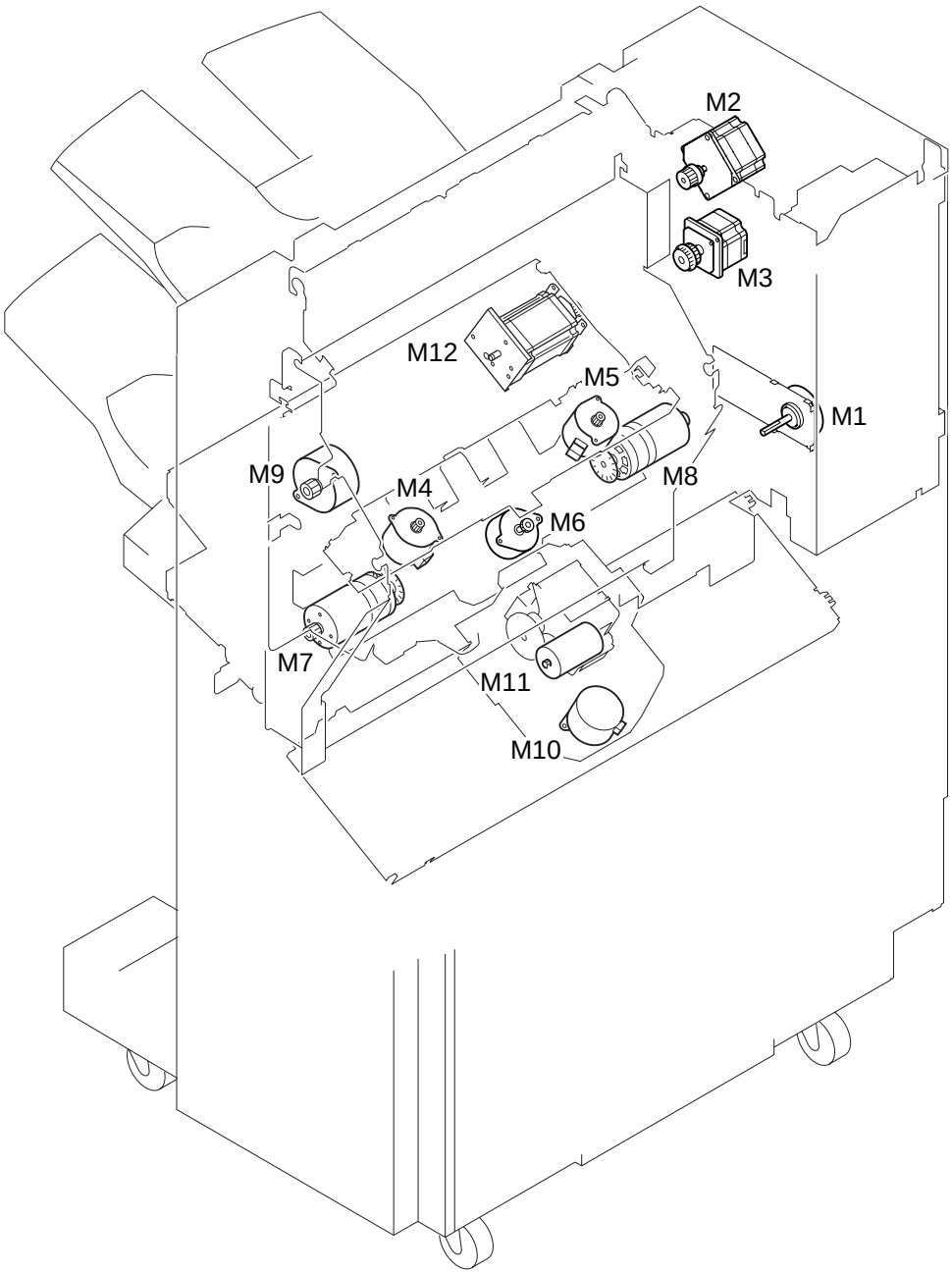

Figure 5-203

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Name	Notation	Function
Motor	M1	Inlet motor
	M2	Buffer motor
	M3	Delivery motor
	M4	Front jogging plate motor
	M5	Rear jogging plate motor
	M6	Tray auxiliary plate motor
	M7	Stack delivery motor
	M8	Swing motor
	M9	Paddle motor
	M10	Stapler shift motor
	M11	Stapler motor (inside the stapler)
	M12	Tray B lift motor

Table 5-203

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D. Solenoids

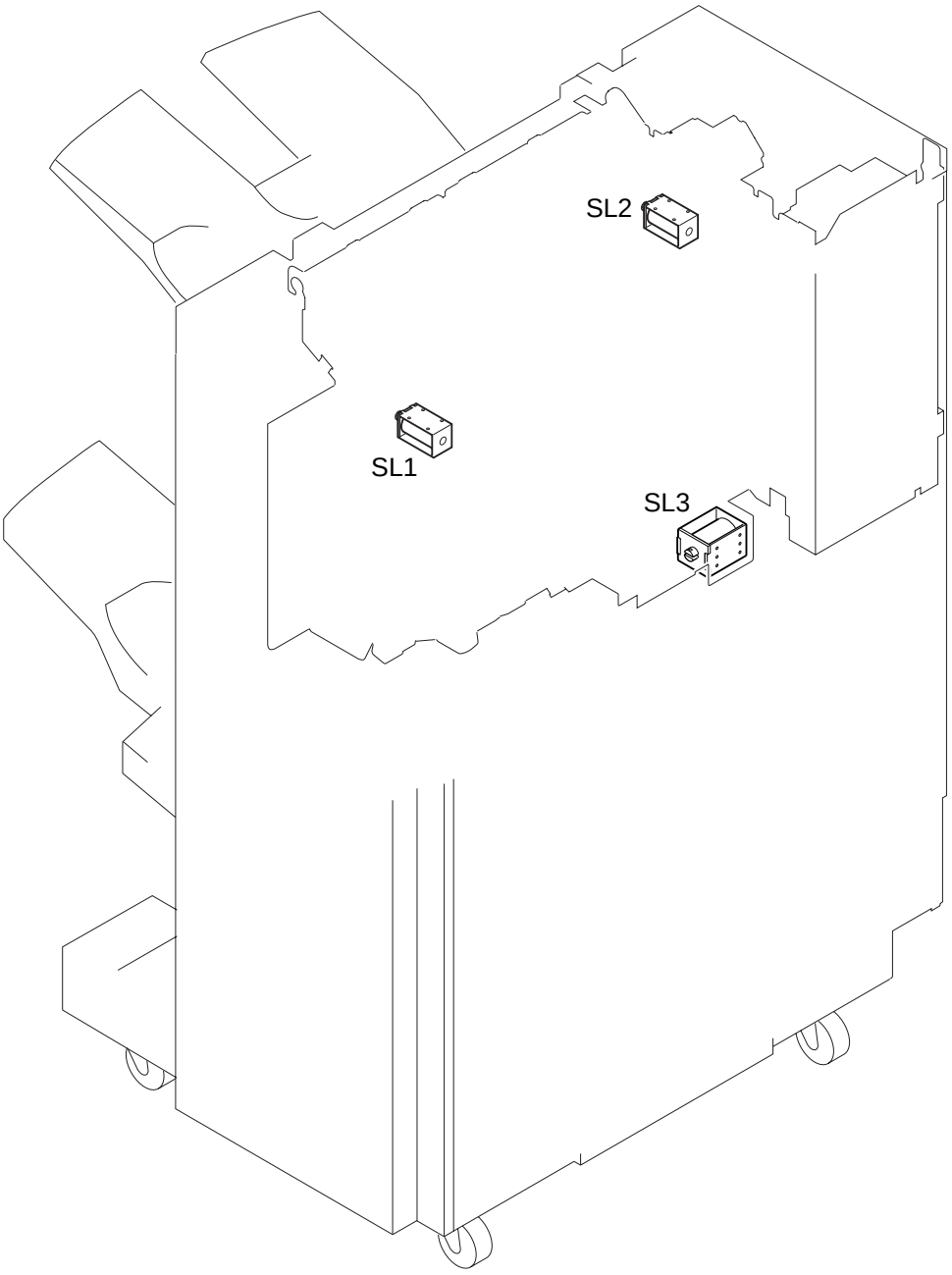

Figure 5-204

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Name	Notation	Function
Solenoid	SL1	Buffer switching solenoid
	SL2	Upper path switching solenoid
	SL3	Knurled belt solenoid

Table 5-204

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E. PCBs

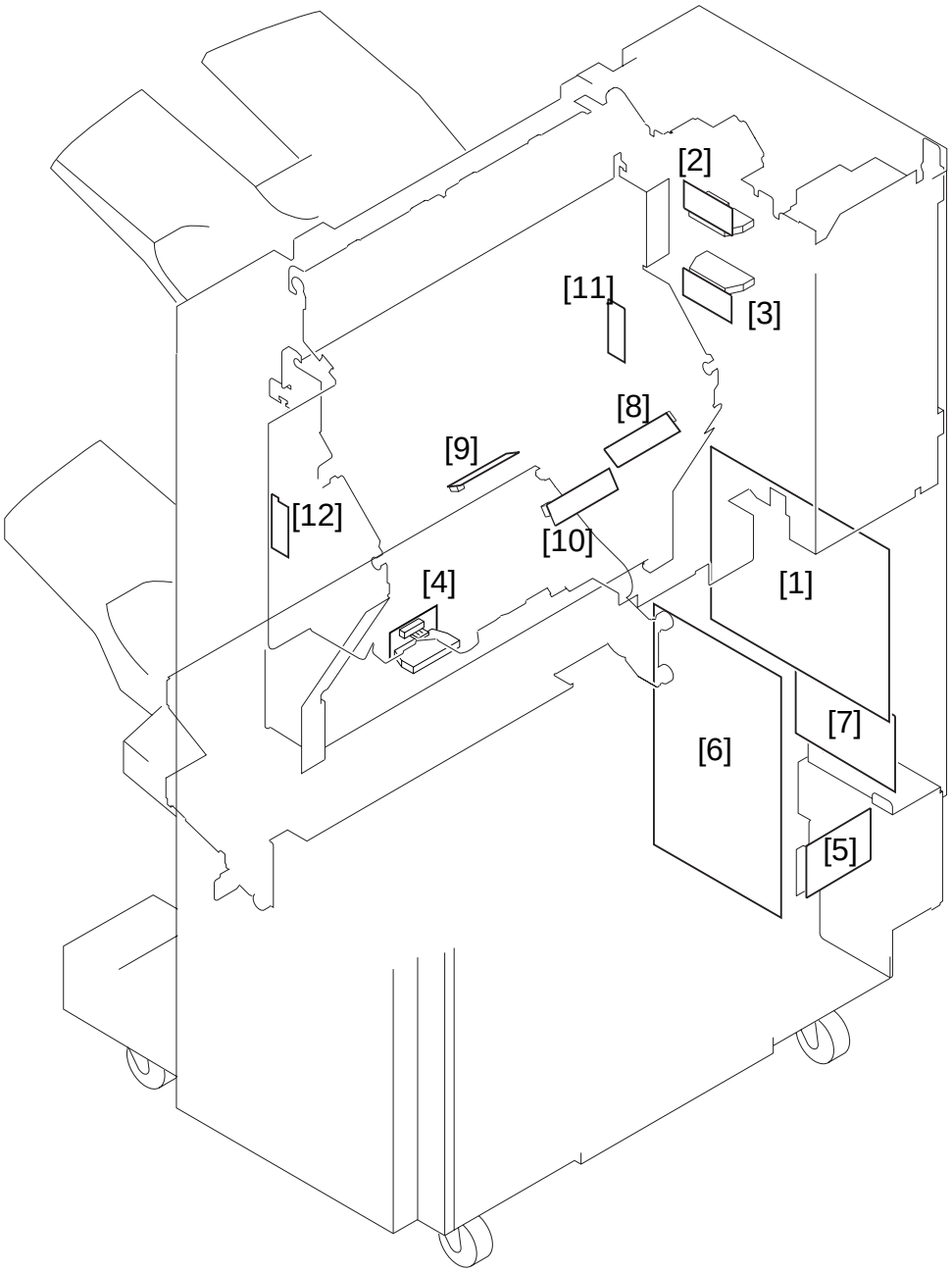

Figure 5-205

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Ref.	Name
[1]	Finisher controller PCB
[2]	Buffer motor driver PCB
[3]	Delivery motor driver PCB
[4]	Tray B lifter motor driver PCB
[5]	AC fuse PCB
[6]	Switching regulator
[7]	Fuse PCB
[8]	Inlet path paper detection (S1)
[9]	Buffer path paper detection (S2)
[10]	Lower path paper detection (S3)
[11]	Tray B paper sensor LED
[12]	Tray B paper sensor PCB (S4)

Table 5-205

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F. Fans

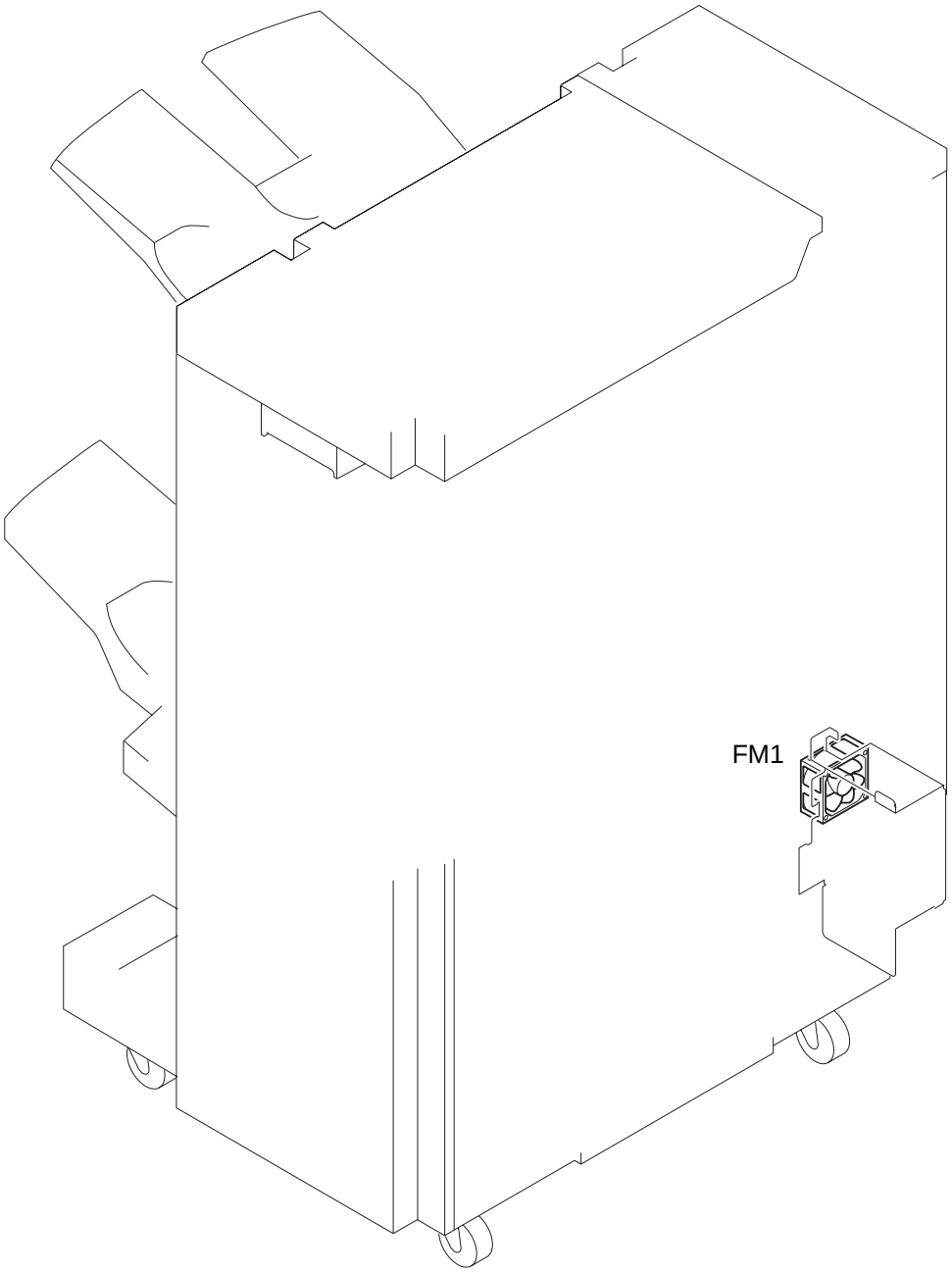

Figure 5-206

FM1	Power supply fan

Table 5-206

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G. Light-Emitting Diodes and Check Pins by PCB

Of the light-emitting diodes and check pins used in the machine, those needed in the field are discussed.

Caution:
The variable resistors (VR) and check pins not found in the tables are for factory use only, and require special tools and high accuracy. Do not touch them in the field.

1. Finisher Controller PCB

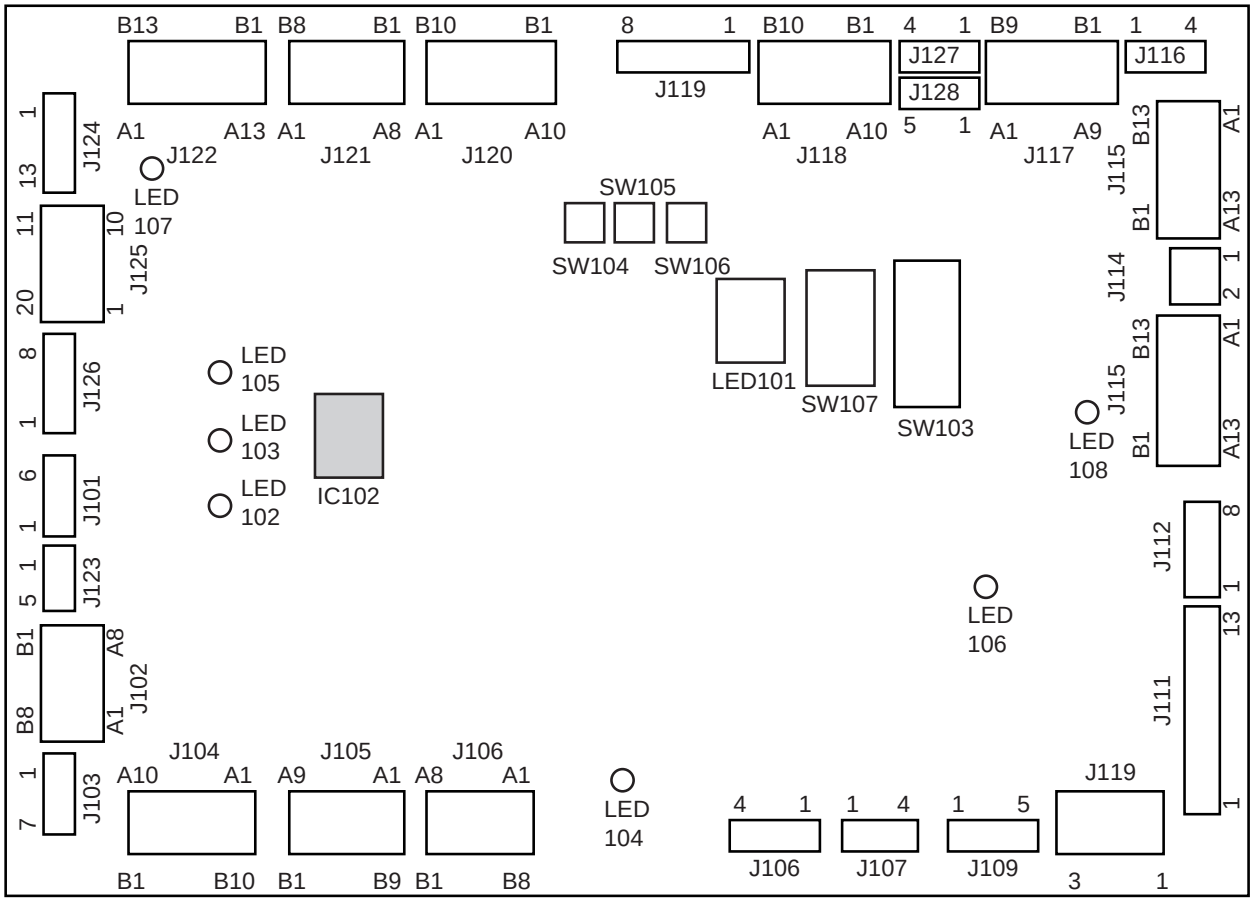

Figure 5-207

LED	Description
LED101	Indicates various states: • error • jam • settings
LED102	Turns on at 5 V (J101-5).
LED103	Turns on at 24 VR (J101-1).
LED104	Turns on when the stack delivery motor (M7) is rotating normally (in response to clock pulses from the stack delivery motor clock sensor (PI12).
LED105	Turns on at 24 VU (J101-3).
LED106	Flashes when the slave RAM (IC121) is in operation.
LED107	Turns on when the inlet motor (M1) is rotating normally (in response to clock pulses form the inlet motor).
LED108	Turns on at 36 V (J114-1).

Table 5-207

Switch	Description
SW103	Use it to set various adjustment modes.
SW104	Use it to start and store adjustment inputs.
SW105	Use it to enter adjustment values in + direction.
SW106	Use it to enter adjustment values in - direction.
SW107	Use it to set various modes.

Table 5-208

State	LED101 indication
Error	In response to an error, 'E5XXxx' will be indicated. • E5XX→error code • xx→detail code
Jam	In response to a jam, 'Jxx' will be indicated in sequence. • Jxx→jam code
Settings	For indication, see the items under various adjustments.

Table 5-209

Function of the Shorting Connector

Connector	Description
J126-6 -8	Connection of the power line to the inlet motor (M1) and the buffer motor (M2).

Table 5-210

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2. DIP Switch Settings and Functions

The settings and functions are for SW103 on the finisher controller PCB.

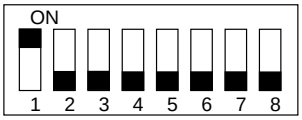
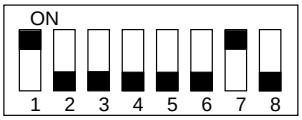
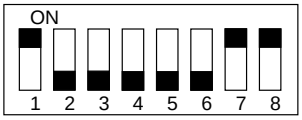
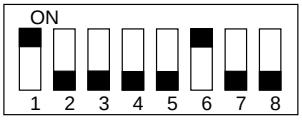
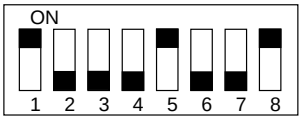
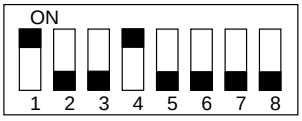
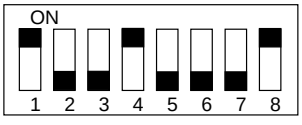
Settings	Item	Description
	Inlet motor operation	A press on SW104 causes the motor to rotate. Another press stops it.
	Buffer motor operation	
	Delivery motor operation	
	Stack delivery motor operation	
	Swing operation	A press on SW104 opens the swing guide. Another press closes it.
	Auxiliary tray operation	A press on SW104 moves the auxiliary tray to move outside the machine. Another press moves it inside the machine.
	Paddle operation	A press on SW104 rotates the paddle for a specific period of time. To operate it for a second time, turn off and then on the power, and then press SW104.
	Solenoid operation	Each press on SW104 turns on the solenoids (buffer path switching, upper path switching, and knurled belt) in sequence. To operate them for a second time, turn off and then on the power, and press SW104.
	Stapling operation	Each press on SW104 starts stapling operation.
	Stapler sliding operation	Each press on SW104 moves the staple from the home position or to the home position.

Table 5-211

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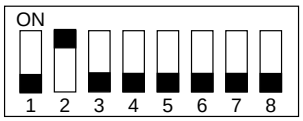
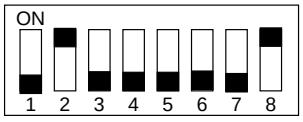
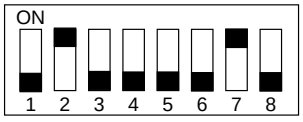
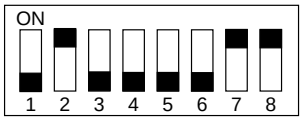
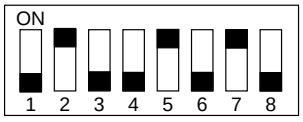
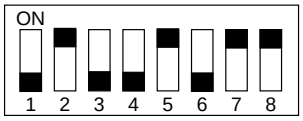
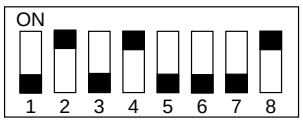
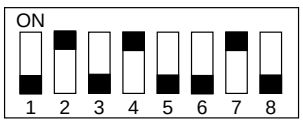
Settings	Item	Size	Description
	Alignment width adjustment	A4	See the descriptions under each item.
	Stapling position adjustment (front, 1-point)		
	Stapling position adjustment (2-point)		
	Stapling position adjustment (rear, 1-point)		
	Alignment width adjustment	LTR	
	Stapling position adjustment (front, 1-point)		
	Stapling position adjustment (2-point)		
	Stapling position adjustment (rear, 1-point)		
	Sensor initial adjustment	See the descriptions under each item.	
	Swing guide speed adjustment		
	Swing guide speed indication	A press on SW104 indicates the swing guide speed.	

Table 5-212

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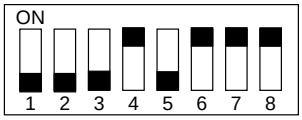
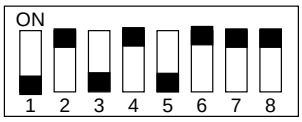
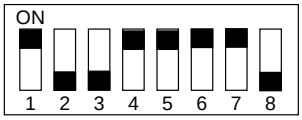
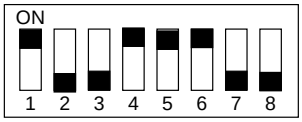
Settings	Item	Description
	Buffer roller wrapping degree adjustment (feeding operation)	See the descriptions under each item.
	Buffer roller wrapping degree adjustment (adjustment value input)	
	RAM initialization	A press on SW104 and SW105 at the same time initializes the RAM.
	E505 resetting	A press on SW104 resets 'E505'.

Table 5-213

III . TROUBLESHOOTING

1. E500 (communication with the copier)

Cause	Step	Checks	Yes/No	Action
Finisher controller PCB, Copier DC controller PCB	1	Turn off and on the copier's power switch. Is the problem corrected?	Yes	End.
Fuse PCB	2	Are the communication line and the grounding line on the fuse PCB normal? J716-7 and J717-1 J716-6 and J717-3 J716-4 and J717-4 J716-5 and J717-5	No	Replace the fuse PCB.
Switching regulator	3	Is the voltage between J85-1 (+) and J85-2 (-) on the switching regulator 5 V?	No	Replace the switching regulator.
Wiring	4	Is the wiring between the finisher controller PCB and the switching regulator normal?	No	Correct the wiring.
	5	Is the wiring between the copier's DC controller PCB and the fuse PCB normal?		
Finisher controller PCB, Copier DC controller PCB	6	Replace the finisher controller PCB. Is the problem corrected?	Yes	End.
			No	Replace the copier's DC controller PCB.

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2. E505 (check sum)

Cause	Step	Checks	Yes/No	Action
Finisher controller PCB	1	Turn off and then on the copier's power switch. Is the problem corrected?	Yes	End.
	2	Turn off the power, and shift bits 1, 4, 5, and 6 of SW103 on the finisher controller PCB to ON. Turn on the power, and press SW104 on the finisher controller PCB. Turn off the power, and shift all bits of SW103 to OFF. Turn on the power. Is the problem corrected?	Yes	End.
			No	Replace the finisher controller PCB.

3. E510 (inlet motor M1)

Cause	Step	Checks	Yes/No	Action
	1	Is LED103 on the finisher con troller PCB at time of power-on?	No	Go to step 2.
			Yes	Go to step 7.
Switching regulator	2	Is the voltage between J85-3, 4 (+) and J85-5, 6 (-) on the switching regulator 24 V?	No	Replace the switching regulator.
Wiring	3	Is the voltage between J711-7, -8 (+) and J711-5, -6 (-) on the fuse PCB 24 V?	No	Correct the wiring between J85 and J711.
Front cover switch (MSW1)	4	Disconnect J715 of the fuse PCB. Check the electrical continuity between J715-1 and J715-3 on the harness side. Is there electrical continuity when the front cover is closed and no electrical continuity when the cover is closed?	No	Check to make sure that the actuator of the front cover is pushing the switch. If so, replace the switch, or correct the wiring between the PCB and the switch.
Fuse PCB	5	Is the voltage of J714-1(+) on the fuse PCB 24 V?	No	Replace the fuse PCB.

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Cause	Step	Checks	Yes/No	Action
Wiring	6	Is the voltage of J101-1 (+) on the finisher controller PCB 24 V?	No	Correct the wiring between J714 on the fuse PCB and J101 on the finisher controller PCB.
Shorting connector	7	Is the shorting connector between J126-6 and -8 on the finisher controller PCB normal?	No	Connect the shorting connector correctly.
Finisher controller PCB	8	Is the voltage between J124-12, -13 (+) and J-124-10, -11 (-) on the finisher controller PCB 24 V?	No	Replace the finisher controller PCB.
	9	Is the voltage between J124-9 (+) and -8 (-) on the finisher controller PCB 5 V?		
Wiring	10	Is the wiring btween J124 on the finisher controller PCB and J4 of the inlet motor normal?	No	Correct the wiring.
Inlet motor (M1)			Yes	Replace the inlet motor.

4. E514 (stack delivery motor M7)

Cause	Step	Checks	Yes/No	Action
	1	Does the steck delivery motor rotate in keeping with stack delivery?	Yes	Go to step 2.
			No	Go to step 4.
Wiring	2	Is the wiring between the finisher controller PCB and the sensor normal?	No	Correct the wiring.
Sensor power supply	3	Measure the voltage between J105B-7 (+) and J105B-8 (-) on the finisher controller PCB. Is it 5 V?	No	Replace the finisher controller PCB.
Stack delivery motor clock sensor (PI12)			Yes	Replace the sensor.
Power supply	4	Is the voltage of J101-3 (+) on the finisher control PCB 24 V?	No	Check the switching regulator and the fuse PCB.
Finisher controller PCB			Yes	Replace the finisher controller PCB.

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5. E530 (rear jogging plate motor M5)

Cause	Step	Checks	Yes/No	Action
	1	Does the rear jogging plate operate in keeping with alignment operation?	No	Go to step 2.
			Yes	Go to step 4.
Finisher controller PCB, Wiring	2	Is the voltage of J10A-6 (+) on the finisher controller PCB 24 V?	No	Check the 24 VU supplied to the finisher controller PCB; if normal, replace the finisher controller PCB. Otherwise, correct the power supply system.
Wiring	3	Are the wiring from J104A-6 to -10 on the finisher controller PCB and the wiring to the rear jogging plate motor normal?	No	Correct the wiring.
			Yes	Replace the rear jogging plate motor.
Rear jogging plate home position sensor (PI9)	4	Is the voltage between J104B-7 (+) and J104B-8 (-) on the finisher controller PCB 5V?	Yes	Replace the sensor.
Finisher controller PCB			No	Replace the finisher controller PCB.

6. E537 (front jogging plate motor M4)

Cause	Step	Checks	Yes/No	Action
	1	Does the front jogging plate operate in keeping with alignment operation?	No	Go to step 2.
			Yes	Go to step 4.
Finisher controller PCB	2	Is the voltage of J104A-1 (+) on the finisher controller PCB 24 V?	No	Check the 24 VU supplied to the finisher controller PCB; if normal, replace the finisher controller PCB. Otherwise, correct the power supply system.
Power supply				
Wiring	3	Are the wiring from J104A-1 to -5 on the finisher controller PCB and the wiring to the rear jogging plate normal?	No	Correct the wiring.
			Yes	Replace the front jogging plate motor.
Front jogging plate home position sensor (PI7)	4	Is the voltage between J104B-1 (+) and J104B-2 (-) on the finisher controller PCB 5	Yes	Replace the sensor.
Finisher controller PCB			No	Replace the finisher controller.

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7. E531 (stapler motor M11)

Cause	Step	Checks	Yes/No	Action
	1	Does the stapler operate in keeping with stapling operation?	Yes	Go to step 2.
			No	Go to step 3.
Stapling home position sensor (PI19), Finisher controller PCB	2	Move the stapler by hand. Does the state of J111-11 (+) on the finisher controller PCB change?	No	Check the power supplied to the sensor; if normal, replace the stapler. Otherwise, replace the finisher controller PCB.
Finisher controller PCB	3	Is 24 VSTP supplied to J113-1 (+) on the finisher controller PCB?	Yes	Replace the finisher controller PCB.
Wiring	4	Is 24 VSTP supplied from J713-4 (+) on the fuse PCB?	Yes	Correct the wiring.
Switching regulator	5	Is 24 VSTP supplied from J713-4 (+) on the switching regulator?	No	Replace the switching regulator.
Wiring			Yes	Correct the wiring from the switching regulator to the fuse PCB; if normal, replace the stapler.

8. E532 (stapler shift motor M10)

Cause	Step	Checks	Yes/No	Action
	1	Does the stapler move at the correct timing?	Yes	Go to step 2.
			No	Go to step 3.
Stapler shift home position sensor (PI17), Finisher controller PCB	2	Move the stapler by hand. Does the state of J112-8 (+) on the finisher controller PCB change?	No	Check the power to the sensor; if normal, replace the sensor. Otherwise, replace the finisher controller PCB.
Finisher controller PCB	3	Is 24 VSTP supplied to J113-1 (+) on the finisher controller PCB?	Yes	Replace the finisher controller PCB.
Wiring	4	Is 24 VSTP supplied from J713-4 (+) on the fuse PCB?	Yes	Correct the wiring.
Switching regulator	5	Is 24 VSTP from J713-4 (+) on the switching regulator supplied?	No	Replace the switching regulator.
Wiring			Yes	Correct the wiring from the switching regulator to the fuse PCB; if normal, replace the motor.

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9. E535 (swing motor M8; detail, FF)

Cause	Step	Checks	Yes/No	Action
	1	Does the swing guide operate at the correct timing?	Yes	Go to step 2.
			No	Go to step 3.
Swing guide open sensor (PI16), Finisher controller PCB	2	Move the swing guide by hand. Does the state of J108B-6 (+) on the finisher controller PCB change?	No	Replace the power to the sensor; if normal, replace the sensor. Otherwise, replace the finisher controller PCB.
Finisher controller PCB	3	Is 24 VU supplied to J101-3 (+) on the finisher controller PCB?	Yes	Replace the finisher controller PCB.
Wiring	4	Is 24 VU from J714-3 (+) on the fuse PCB supplied?	Yes	Correct the wiring.
Switching regulator	5	Is 24 VU supplied from J85-3 (+) on the switching regulator?	No	Replace the switching regulator.
Wiring			Yes	Correct the wiring from the switching regulator to the fuse PCB; if the wiring is correct, replace the motor.

10. E535 (swing motor M8; detail, 01)

Cause	Step	Checks	Yes/No	Action
	1	Does the swing guide operate at the correct timing?	Yes	Go to step 2.
			No	Go to step 3.
Swing guide closed sensor (PI15), Finisher controller PCB	2	Move the swing guide by hand. Does the state of J108B-3 (+) on the finisher controller PCB change?	No	Check the power to the sensor; if normal, replace the finisher controller PCB.
Finisher controller PCB	3	Is 24 VU supplied to J101-3 (+) on the finisher controller PCB?	Yes	Replace the finisher controller PCB.
Wiring	4	Is 24 VU supplied from J714-3 (+) on the fuse PCB?	Yes	Correct the wiring.
Switching regulator	5	Is 24 VU supplied from J85-3 (+) on the switching regulator?	No	Replace the switching regulator.
Wiring			Yes	Check the wiring from the switching regulator to the fuse PCB; if normal, replace the motor.

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11. E542 (tray B upper position sensor PI20; at power-on)

Cause	Step	Checks	Yes/No	Action
Tray position	1	Is tray B above the tray B paper sensor PCB (S4)?	Yes	Lower the tray under the sensor.
Tray B upper position sensor (PI20)	2	Is the tray B upper position sensor (PI20) normal?	No	Check the wiring from the finisher controller PCB to the sensor; if normal, replace the sensor.
			Yes	Replace the finisher controller PCB.

12. E542 (tray B lift motor M12; during operation)

Cause	Step	Checks	Yes/No	Action
36 VDC power supply	1	Is 36 VDC supplied to J114-1 on the finisher controller PCB?	No	Check the supply path of the 36 VDC; if faulty, correct it.
Tray lifter mechanism	2	Is there a fault or an obstacle in the tray lifter mechanism?	Yes	Remove the fault or the obstacle.
Tray B lifter motor (M12)	3	Does the tray lifter motor rotate at the correct timing?	No	Replace the tray B lifter motor driver PCB.
Tray B lock sensor (PI23)	4	Is the tray B lock sensor normal?	No	Replace the sensor.
Tray B upper position sensor (PI20), Tray B lower position sensor (PI21)	5	Is the tray B upper position sensor and the lower position sensor normal?	Yes	Replace the appropriate sensor.
			No	Replace the finisher controller PCB.

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13. E551 (power supply fan FM1)

Cause	Step	Checks	Yes/No	Action
Finisher controller PCB	1	Is the level of J103-8 on the finisher controller PCB 0?	No	Replace the finisher controller PCB.
Fuse PCB	2	Is the voltage of J720-1 on the fuse PCB 24 DC?	No	Replace the fuse PCB.
Power supply fan (FM1)	3	Is the power supply fan rotating?	No	Replace the power supply fan.
Finisher controller PCB	4	Is the level of J103-7 on the finisher controller 1?	No	
			Yes	Replace the finisher controller PCB.

14. E577 (paddle motor M9)

Cause	Step	Checks	Yes/No	Action
Paddle home position sensor (PI14)	1	Is the paddle home position sensor normal?	No	Replace the sensor.
Paddle motor (M9), Finisher controller PCB	2	Does the paddle rotate at the correct timing?	No	Replace the motor and the finisher controller PCB.

15. E583 (tray auxiliary plate motor M6)

Cause	Step	Checks	Yes/No	Action
Tray auxiliary plate home position sensor (PI11)	1	Is the tray auxiliary plate home position sensor normal?	No	Replace the sensor.
Tray auxiliary plate motor (M6), Finisher controller PCB	2	Does the tray auxiliary plate motor rotate at the correct timing?	No	Replace the motor and the finisher controller PCB.

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IV. SELF DIAGNOSIS

The CPU (IC101) on the finisher controller PCB is equipped with a self diagnostic mechanism which checks the state of the machine as needed; upon detection of an error, it communicates the fact to the copier in the form of "code" and "detail code."

You can check the detail code in service mode or in reference to LED101 on the finisher controller PCB.

A. Self Diagnosis

Code	Item	Description
E500	• Data communication error	• The communication between the copier and the machine stops, and does not return to normal after a retry for 5 sec. • In addition to the above condition, a retry has been made three times in 5 sec.
E501		• The communication between the master CPU (IC101) and the slave CPU (IC121) stops.
E505	• Back-up RAM (EEP-ROM)	• The check sum has a fault at power-on.
E510	• Inlet motor (M1)	• While the motor is in operation, the clock pulses from the inlet motor are under an equivalent of 50 mm/sec for 1 sec or more.
E514	• Stack delivery motor (M7) • Stack delivery motor clock sensor (PI12)	• While the motor is in operation, the clock pulses from the stack delivery motor clock sensor is under an equivalent of 50 mm/sec for 1 sec or more.
E537	• Front jogging plate motor (M4) • Front jogging plate home position sensor (PI7)	• The front jogging plate does not leave the front jogging plate home position sensor when the front jogging plate motor has been driven for 4 sec. • The front jogging plate does not return to the front jogging plate home position sensor when the front jogging plate motor has been driven for 4 sec.
E530	• Rear jogging plate motor (M5) • Rear jogging plate home position sensor (PI9)	• The rear jogging plate does not leave the rear jogging plate home position sensor when the rear jogging plate motor has been driven for 4 sec. • The rear jogging plate does not return to the rear jogging plate home position sensor when the rear jogging plate motor has been driven for 4 sec.
E531	• Stapler motor (M6) • Staple home position detecting switch (MS7)	• The stapler does not leave the stapling home position when the stapler motor has been driven for 0.5 sec or more. • The stapler does not return to the stapling home position when the stapler motor has been driven for 0.5 sec.

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Code	Item	Description
E532	• Staple shift motor (M10) • Stapler shift home position sensor (PI7)	• The stapler shift home position sensor does not turn off when the stapler shift motor has been driven for 4 sec. • The stapler shift home position cannot be detected when the stapler shift motor has been driven for 4 sec.
E535	• Swing motor (M8) • Swing guide open sensor (PI16)	• The swing guide swing sensor does not detect the swing guide when the swing motor has been rotated for 2 sec. (detailed code FF)
	• Swing motor (M8) • Swing guide closed sensor (PI5)	• The swing guide closed sensor does not detect the swing guide when the swing motor has been rotated for 2 sec. (detail code 01)
E542	• Tray B lift motor (M12) • Tray B locked sensor (PI23) • Tray B lower limit sensor (PI24) • Tray B upper position sensor (PI20) • Tray lower position sensor (PI21)	• The upward movement does not end within 25 sec when the tray lift motor has been driven. • The clock pulses from the tray idle rotation sensor while the motor is rotating stop for 250 msec. • The input from the tray B position sensor (PI20) is 0 at power-on. (Tray B is above the tray paper sensor PCB.)
E551	• Power supply fan (FM1)	• The power supply fan is identified to have stopped for 2 sec.
E577	• Paddle motor (M9) • Paddle home position sensor (PI14)	• The paddle home position sensor does not detect the paddle 5 sec after the motor has been driven.
E583	• Tray auxiliary plate motor (M6) • Tray auxiliary plate retraction sensor (PI11)	• The tray auxiliary plate retraction sensor does not turn on 2 sec after the motor has been driven when the tray auxiliary plate is being retracted.

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B. Alarms

Code	Error	Conditions	Detection	Machine operation	Resetting
0AH	No staple	• The staple catridge is empty.	• Motors at all times.	• Normal operation may be continued; however, it is prevented by the copier.	• Replace the stapler cartridge; or, set the cartridge correctly.
02H	Tray B overstacking	• The number of sheets or stacks placed on the tray is more than allowed.	• Monitored at all times.	• Normal operation may be continued.	• The absence of paper on the tray is detected while the machine is at

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APPENDIX

A. GENERAL TIMING CHART A-1
B. SIGNALS AND ABBREVIATIONS A-3
C. GENERAL CIRCUIT DIAGRAM A-5
D. SOLVENTS AND OILS A-7

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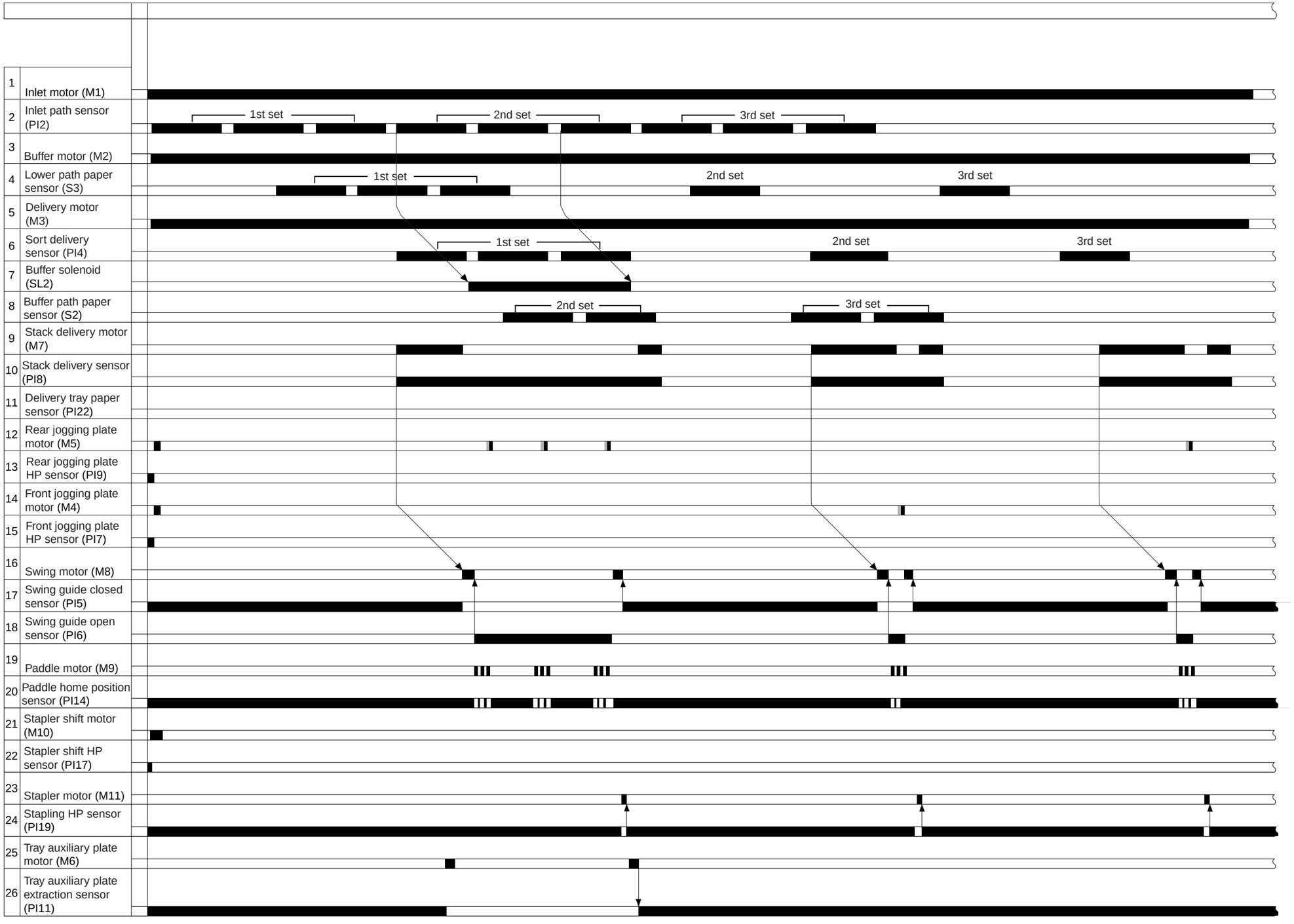
A. GENERAL TIMING CHART

A4, 3 Copies, 3 Sets, 1-Point, Front Stapling


1 Inlet motor (M1)
2 Inlet path sensor (PI2)
1st set
2nd set
3rd set
3 Buffer motor (M2)
4 Lower path paper sensor (S3)
1st set
2nd set
3rd set
5 Delivery motor (M3)
6 Sort delivery sensor (PI4)
1st set
2nd set
3rd set
7 Buffer solenoid (SL2)
8 Buffer path paper sensor (S2)
2nd set
3rd set
9 Stack delivery motor (M7)
10 Stack delivery sensor (PI8)
11 Delivery tray paper sensor (PI22)
12 Rear jogging plate motor (M5)
13 Rear jogging plate HP sensor (PI9)
14 Front jogging plate motor (M4)
15 Front jogging plate HP sensor (PI7)
16 Swing motor (M8)
17 Swing guide closed sensor (PI5)
18 Swing guide open sensor (PI6)
19 Paddle motor (M9)
20 Paddle home position sensor (PI14)
21 Stapler shift motor (M10)
22 Stapler shift HP sensor (PI17)
23 Stapler motor (M11)
24 Stapling HP sensor (PI19)
25 Tray auxiliary plate motor (M6)
26 Tray auxiliary plate extraction sensor (PI11)
: CW
: CCW

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B. LIST OF SIGNALS/ABBREVIATIONS

The following is a list of signals and abbreviations used in this document and the circuit diagrams:

Note:
The abbreviations in parentheses are electrical signals but are analog, which cannot be expressed in terms of '1' and '0'. Others are digital signals, which can be expressed as being either '1' or '0'.

BFDMTRCLK	BUFFER MOTOR CLOCK DETECTION Signal
[BFLEDAJ]	BUFFER PATH LED ADJUST Command
BFPCB	BUFFER PAPER PCB PAPER DETECTION Signal
BFPSSCHG	BUFFER PATH CHANGE SOLENOID DRIVE Command
BFPSSXIT	BUFFER PATH EXIT PAPER DETECTION Signal
BNDLDELV	BUNDLE DELIVERY PAPER DETECTION Signal
CRTSET	STAPLE CARTRIDGE SET Signal
[ENTLEDAJ]	ENTRANCE PATH LED ADJUST Command
ENTPASSPA	ENTRANCE PATH PAPER DETECTION Signal
ENTPCB	ENTRANCE PATH PCB PAPER DETECTION Signal
FANON	FAN ON Command
FANSTP	FAN STOP Signal
FDBLT	FEED BELT SOLENOID DRIVE Command
FDROPN	FRONT COVER OPEN Signal
FJOGHP	FRONT JOG PLATE HOME POSITION DETECTION Signal
HOOKEMP	HOOK EMPTY Signal
[LWRPLEDADJ]	LOWER PATH LED ADJUST Command
LWRPPCB	LOWER PATH PCB PAPER DETECTION Signal
	NON-SORT DELIVERY PAPER DETECTION Signal
NSTDLV	PADDLE HOME POSITION Signal
PDLHP	SELF PRIMING Signal
SLFPRIM	SORT TRAY PAPER REMOVAL DETECTION Signal
SOPAPRMV	SORT TRAY PAPER SENSOR LED ADJUST Command
SOTRYLEDAJ	SORT TRAY PAPER SENSOR PAPER DETECTION Signal
SOTRYPAP	SUPPORT TRAY IN DETECTION Signal
SPTTRYIN	SORT DELIVERY PAPER DETECTION Signal
STDLV	STAPLER DRIVE HOME POSITION Signal

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STPDRHP	STAPLER UNIT HOME POSITION Signal
STPLHP	SORT TRAY LOCK DETECTION Signal
STTRYDL	SORT TRAY LOWER LIMIT DETECTION Signal
STTRYLW	SORT TRAY LOWER POSITION DETECTION Signal
STTRYLWPO	SORT TRAY PAPER DETECTION Signal
STTRYPA	SORT TRAY UP POSITION DETECTION Signal
STTRYUPPO	SWING GUIDE CLOSED Signal
SWDGDCL	SWING MOTOR CLOCK DETECTION Signal
SWGMTRCLK	SWING GUIDE OPEN Signal
SWGOPN	UPPER COVER OPEN DETECTION Signal
UPCVROPN	UPPER PATH CHANGE SOLENOID DRIVE Command
UPSCHG	

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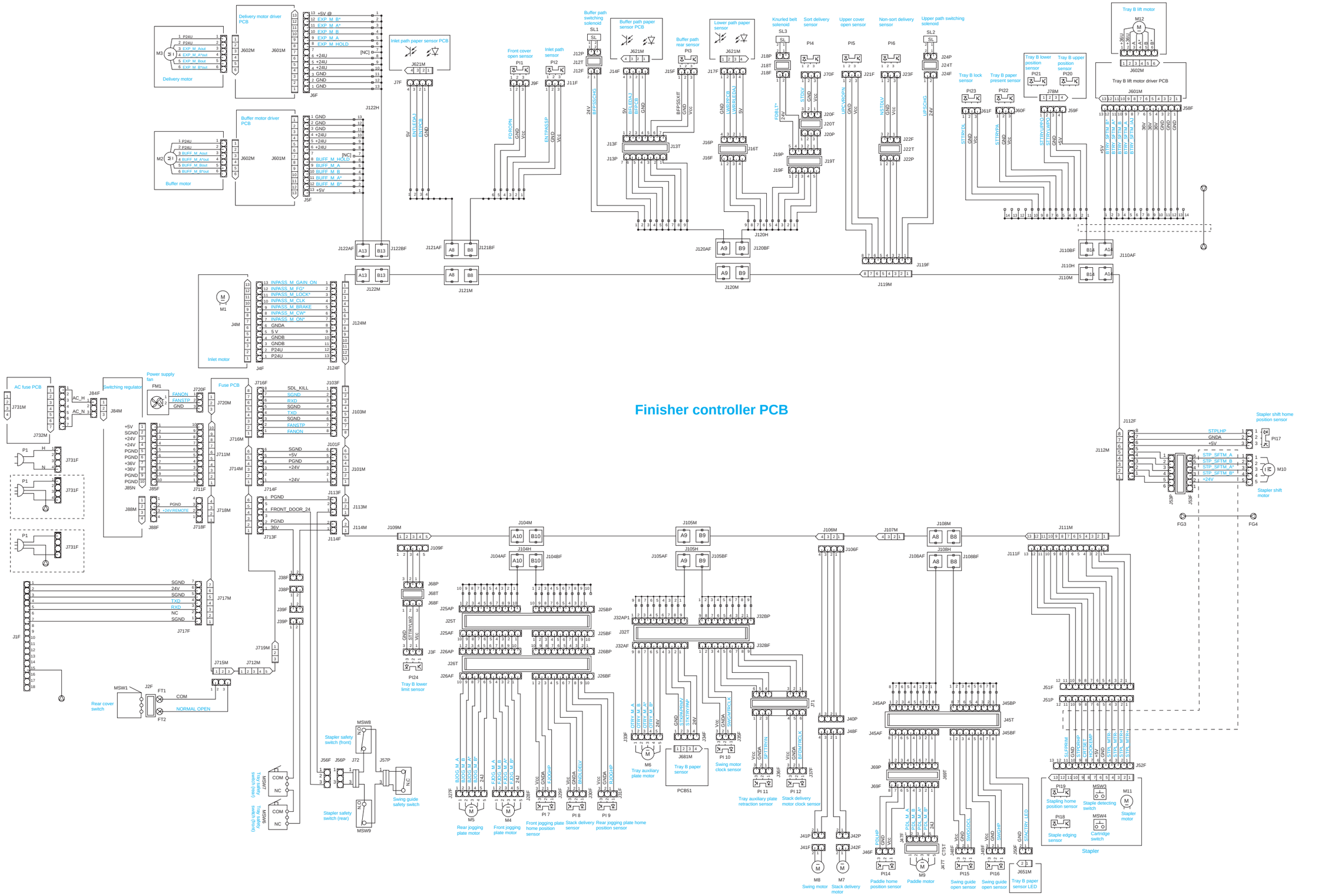
C. General Circuit Diagram



D. SOLVENTS AND OILS LIST

No.	Name	Uses	Composition	Remarks
1	Alcohol	Cleaning; e.g., glass, plastic, rubber (external covers).	Fluorine-family hydrogen carbon, alcohol, surface activating agent	• Do not bring near fire. • IPA (isopropyl alcohol)
2	Lubricant	Driving parts, friction parts (lead cam)	Silicone oil	• FY9-6008 (10g)

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